12778 (3)

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1883.

No. ~~301 & 310~~ 9

GORDON McKAY AND JAMES W. BROOKS, TRUSTEES OF THE McKAY METALLIC FASTENING ASSOCIATION, APPELLANTS,

vs.

EDMUND M. STOWE, CHARLES C. BILLS, AND RICHARD S. WHITNEY.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

FILED OCTOBER 8, 1883.

In witness whereof I have hereunto set my hand and affixed the seal of said Nance county this 27th day of January, A. D. 1886.

[County Seal, Nance County, Nebraska.]

A. M. SHUMAKER,
County Clerk.

In the Supreme Court of the United States for the District of Nebraska.

Now comes the above-named plaintiffs, by J. C. Cowin, their attorney, and move the Court here for leave to dismiss their appeal herein.

J. C. COWIN,
Atty for Pl'ffs.

Endorsed: Supreme Court U. S. 1887, October term. No. 37. James M. Kennedy *et al.*, commissioners of Nance Co. *vs.* Bartley Lamb *et al.* Certified copy of resolutions of Nance county commissioners & motion by J. C. Cowin to dismiss appeal. Office Supreme Court U. S. Filed June 4, 1887. James H. McKenney, clerk.

No Response
127-786
(3)

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1885.

No. 365. ~~110~~ 9

GORDON McKAY AND JAMES W. BROOKS, TRUSTEES OF THE McKAY METALLIC FASTENING ASSOCIATION, APPELLANTS,

vs.

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JUDD & DETWEILER, PRINTERS, WASHINGTON.

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a UNITED STATES OF AMERICA, *Massachusetts District*, } ss:

GORDON McKAY *et al.*, Trustees, Complainants,
v.
EDMUND M. STOWE *et al.*, Defendants. } In Equity.

At a circuit court of the United States for the first circuit, begun and holden at Boston, within and for the district of Massachusetts, on Tuesday, the fifteenth day of May, in the year of our Lord one thousand eight hundred and eighty-three, before the Honora-
b ble John Lowell, circuit judge, the bill of complaint in this cause was filed in the clerk's office on the twenty-fifth day of October A. D. 1878, and was duly entered at the October term of this court, A. D. 1878, and is in the words and figures following, namely:

1 *Bill of Complaint. Filed Oct.* 25, 1878.

To the honorable the judges of the circuit court of the United States for the district of Massachusetts:

Gordon McKay and James W. Brooks, both of Cambridge, in said district, and citizens of the United States, and trustees of the McKay Metallic Fastening Association, bring this bill of complaint against Edmund M. Stowe, Charles C. Bills, and Richard S. Whitney, all of Hudson, in said district, and partners under the style of Stowe, Bills & Whitney.

1. And thereupon your orators complain and say that prior to the twenty-fourth day of July, A. D. 1874, the said Gordon McKay and Hadley P. Fairfield, of Boston, in said district, were the true, original, and first inventors of certain new and useful improvements in sole-nailing machines not known or used before, and not at the time of their application for letters patent in public use or on sale; that the said McKay and Fairfield, on said twenty-fourth day of July, 1874, applied for letters patent for said improvements, and on the thirteenth day of October, 1874, letters patent of the United States, executed in due form of law, for said invention or discovery, were duly issued to the said Gordon McKay, as the assignee of said McKay and Fairfield, whereby there was secured to him, his legal
2 representatives and assigns, for the term of seventeen years from said Oct. 13, 1874, the full and exclusive right of making, using, and vending the said improvements.

2. That on account of the imperfect and defective description of the invention and improvements aforesaid in the said letters patent, caused by accident and mistake, and not by the intention, design, or fault of the said McKay and Fairfield, the said letters patent were duly surrendered prior to the twenty-eighth day of March, 1876, and canceled as provided by law, and upon said last-named day letters patent of the United States for said improvement and discovery, upon an amended specification which had been duly filed, were issued to the said Gordon McKay as the assignee of the said McKay and Fairfield, whereby there was secured to said McKay, his legal

representatives and assigns, for the term of seventeen years from said Oct. 13, 1874, the full and exclusive right to make, use, and sell the said improvements.

3. That on the ninth day of June, A. D. 1877, the said reissued patent No. 7,014 was duly assigned to James J. Storrow, of Boston, in said district, and on the same day the said Storrow duly assigned the said reissued patent No. 7,014 to your orators, as will appear by said assignment in writing duly recorded, and here in court to be produced.

4. Your orators further show that prior to the twentieth day of April, 1875, one Louis Goddu, of Winchester, in the State of Massachusetts, and a citizen of said State and of the United States, was the first, true, and original inventor of certain improvements in machines for nailing shoe-soles from nail strips not known or used before and not at the time of his application for letters patent in public use or on sale; that on said day the said Goddu applied for for letters patent for said improvements, and on the eighteenth day of May, 1875, letters patent of the United States, executed in due form of law, for said invention or discovery, were issued to the American Cable Screw Wire Company as the assignees of said Goddu, whereby there was secured to the said company, its legal representatives, successors, and assigns, for the term of seventeen years from said May 18, 1875, the sole and exclusive right of making, using, and vending said improvements; that thereafter,
3 and before the grievances hereinafter complained of, the said letters patent were duly assigned to your orators, as will fully appear from said assignment, ready in court to be produced.

5. That said inventors and your orators have applied said improvements to practical use, and the same are of great practical value and utility in the manufacture of boots and shoes, and that they are entitled to enjoy all the benefits and to receive all the profits derivable therefrom, and would be in the sole and exclusive enjoyment thereof but for the wrongful acts of the defendants.

6. And your orators aver that the said defendants, in defiance of your orators' rights, have made, used, and sold, or offered for sale, the said patented improvements of your orators, and especially by embodying and using them in a machine or machines for the nailing of the soles of boots and shoes to their uppers; and the defendants, as your orators are informed, believe, and aver, threaten and intend to continue the said unlawful manufacture, use, and sale, namely, at Hudson, in said district.

7. To the end, therefore, that the defendants may be compelled to make full answer and discovery hereto, and that they may be compelled to account for and pay over all income and profits thus unlawfully derived from the violation of the rights of your orators, and also all damages sustained by your orators by reason of said infringements of your orators' rights, and be restrained from any further violation of said rights, your orators pray for a writ of injunction, restraining the defendants forthwith and during the pendency of this suit, and perpetually, from the construction, sale, or use, in any manner, of said patented improvements, or any part thereof.

And your orators pray for such other relief as the equity of the case may require. May it please your honors to grant unto your orators a writ of injunction, conformable to the prayer of this bill, and also a writ of subpœna, directed to the said defendants, commanding them to appear and answer unto this bill, and to abide and perform all orders and decrees of this court in the premises.

GORDON McKAY,
JAMES W. BROOKS,
Trustees.

By GORDON McKAY.
ELIAS MERWIN,
Solicitor and of Counsel with Complainants.

4 DISTRICT OF MASSACHUSETTS, *ss:*

OCT. 24, 1878.

Then personally appeared the said Gordon McKay, and made oath that he had read the foregoing bill and knew the contents thereof; that the same are true so far as stated upon personal knowledge, and so far as stated upon information and belief he believes them to be true.

Before me. WINSLOW WARREN,
U. S. Com'r.

This cause was thence continued from term to term to the October term, A. D. 1879, when *to* Feb. 26, 1880, the following answer was filed, namely:

Answer. Filed Feb. 26, 1880.

The joint and several answer of Edmund M. Stowe, Charles C. Bills, and Richard S. Whitney, respondents, to the bill of complaint of Gordon McKay and James W. Brooks, trustees, complainants.

The said defendants, reserving to themselves, now and hereafter, all and all manner of benefit of exception to the manifold errors and insufficiencies in said bill contained, for answer to so much thereof as they are advised is material to be answered unto, answering, say:

They admit that on the thirteenth day of October, 1874, letters patent were issued to said Gordon McKay as assignee of said McKay and Hadley P. Fairfield, but they have at present no knowledge or information, nor have they at present any ground for forming any belief, as to whether or not said McKay and said Fairfield are the true, original, and first inventors of the alleged new and useful improvements in sole-nailing machines for which said letters patent were granted, all as set forth in said bill.

Further answering, these defendants admit that said letters patent were surrendered and canceled, and that on March 28, 1876, new letters patent were issued to said McKay; but they deny that the description of the alleged invention and improvements in the original letters patent above mentioned was imperfect or defective, and they aver that the alleged invention was well described in full, clear, con-

cise, and exact terms, and particularly pointed out and distinctly claimed in the specification and claims of said original patent;
5 and they aver that the said original letters patent were not inoperative or invalid by reason of a defective or insufficient specification, nor, as far as they are at present informed, for any other reason; and they deny that said reissued letters patent are for the same invention as were the original letters patent.

Further answering, these defendants deny that the thing claimed in the first clause of claim of the said reissued letters patent is an art, machine, manufacture, or composition of matter, or any new and useful improvement thereof; and they aver that the thing claimed in said first clause of claim is wholly inoperative and worthless.

Further answering, these defendants deny, on information and belief, that said McKay and Fairfield are the original, first, and joint inventors of any material and substantial part of the things patented in said reissued letters patent No. 7,014, save and except the mechanism therein described for selecting a nail from one of a number of receptacles and carrying the nail so selected to the proper place, and certain combinations of that mechanism with other ingredients described in said reissued letters patent; and as to this mechanism and the combinations of it with other ingredients these defendants have no knowledge nor any belief as to whether said McKay and Fairfield are the original, first, and joint inventors or not, but, as at present informed, they have no reason to doubt that they are.

Further answering, these defendants say that nothing in any wise resembling the subject-matter of the first clause of claim of said reissued patent No. 7014 is described, suggested, or substantially indicated as of the invention of said McKay and Fairfield in the said original letters patent No. 155,962; and they further aver that the said original letters patent were surrendered, and the said reissued letters patent obtained for the purpose of unduly expanding the claims, in order to cover machines not embodying in their construction and operation any invention described, suggested, or substantially indicated in the original letters patent, and that the second, third, and fourth clauses of claims are broader than the invention, if any, of said McKay and Fairfield, unless the abovementioned selecting and carrying mechanism be an essential ingredient in the several combinations claimed in these clauses of claim.

6 Further answering, these defendants, on information and belief, deny that the machine described in letters patent to Goddu, No. 163,474, dated May 18, 1875, is practically operative; that any such machine has ever been used in the manufacture of boots or shoes, and that any such machine could be so used. They have no knowledge, information, or belief as to who invented said machine.

Further answering, these defendants aver that they are entirely ignorant as to the assignments alleged in said bill, and leave the complainants to make such proof thereof as they see fit.

Further answering, these defendants deny, upon information and

belief, that said alleged improvements have been applied to practical use; they also deny that the same are of great practical value or utility in the manufacture of boots and shoes; they also deny that said complainants are entitled to enjoy all the profits derivable therefrom; they also deny that said complainants would be in the sole and exclusive enjoyment thereof but for the alleged wrongful acts of the defendants.

Further answering, these defendants deny, upon their own certain knowledge, that they have made, used, or sold, or offered for sale, any substantial or material part of any of the said patented improvements of the complainants, whether in a machine or machines for the nailing of the soles of boots and shoes to their uppers, or in any other machine or machines, or that they ever threatened or intended to use said alleged improvements in Hudson, in said district, or in any other place or district.

Wherefore these defendants submit that the complainants are not entitled to the relief, or any part thereof, prayed for in said bill of complaint, without this that any other matter in said bill contained material to be answered unto, and not herein sufficiently answered unto, confessed and avoided, traversed or denied, is true.

All which matters and things these defendants are ready to aver, maintain, and prove as this honorable court shall direct, and pray to be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

EDMUND M. STOWE.
CHAS. C. BILLS.
RICHARD S. WHITNEY.

7 STATE OF MASSACHUSETTS, } ss:
County of Suffolk, }

On the eighteenth day of February, eighteen hundred and eighty, personally appeared the above-named Richard S. Whitney and made oath that he is a member of the firm of Stowe, Bills & Whitney, and that he has read the above answer by him subscribed and that the same is true to the best of his knowledge, information, and belief.

Before me.

[SEAL.] FRANCIS H. LINCOLN,
Notary Public.

And on the same day the following replication was filed, namely:

Replication. Filed Feb. 26, 1880.

These repliants, saving and reserving unto themselves all and all manner of advantage of exception which may be had and taken to the manifold errors, uncertainties, and insufficiencies of the answer of said defendants, for replication thereunto say that they do and will aver, maintain, and prove their said bill to be true, certain, and sufficient in law to be answered unto by said defendants, and that the answer of said defendants is uncertain, evasive, and insufficient in law to be replied to by these repliants, without this, that any

other matter or thing in the said answer contained, material or effectual in law to be replied unto, and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed or denied, is true; all which matters and things these repliants are ready to aver, maintain, and prove as this honorable court shall direct, and humbly pray as in their said bill they have already prayed.

By ELIAS MERWIN,
Solicitor for Complainants.

This cause was thence continued from term to term to the May term, 1882, when, to wit, May 26, 1883, publication of the testimony having been had, this cause was set down for hearing and fully heard by the court, the Honorable Horace Gray, associate justice, and the Honorable John Lowell, circuit judge, sitting. This cause was thence continued under advisement from term to term to this present term, and now, to wit, June 22, 1883, the opinion of the court is delivered by the Honorable Horace Gray, associate justice, and it is thereupon ordered, adjudged, and decreed that the bill of complaint in this cause be, and the same is hereby, dismissed with costs for the defendants, taxed at ——, and that execution issue therefor according to law. From this decree the complainants, in open court, claim an appeal to the Supreme Court of the United States, and give good and sufficient security that they will prosecute their said appeal to effect and answer all damages and costs if they fail to make their plea good, and said appeal is allowed accordingly.

A true record.

JOHN G. STETSON, *Clerk.*

8 The following is the evidence used in the hearing of said cause before said circuit court, namely:

Evidence for Complainants. Taken Pursuant to the Sixty-Seventh Rule of the Supreme Court of the United States, in Equity, as Amended, Before Me, Henry C. Merwin, Special Examiner.

BOSTON, *June* 18, 1880.

Present: Elias Mervin, Esq., of counsel for complainants; James E. Maynadier, Esq., of counsel for defendants.

Deposition of John C. Hoadley.

Direct examination by ELIAS MERWIN, Esq., of counsel for complainants.

BOSTON, *June* 18, 1880.

Int. 1. What is your name, age, residence, occupation, and experience in comparing machines, as to their resemblances and differences, and as an expert witness in patent causes?

Ans. John C. Hoadley; age, sixty-one; residence, Lawrence, Massachusetts. After nearly ten years' practice as civil engineer, principally on the enlargement of the Erie canal, in the State of New York, I took charge, on the first day of January, 1845, in my twenty-seventh year of the construction of mills and factories, with

their water power, dwelling houses, etc., at Clinton (then a part of Lancaster), Worcester county, Mass., and remained there nearly four years as civil engineer, doing, also, a good deal of drawing for the late Erastus B. Bigelow upon designs for machines of his own invention. From 1848 to 1858 I was engaged in the manufacture of machinery, during the last six years of that period as the superintendent of the Lawrence machine shop, making most of the original drawings of machinery, and directing the work of a dozen draughtsmen and a score of pattern makers at times. The work embraced all the machines then used in the cotton and woollen manufacture, in paper and cordage manufactures, a power printing press, a sewing machine for closing boot legs, turbine and other water
9 wheels, and steam engines, large and small, stationary, locomotive, and portable, and a great variety of machinists' tools, and miscellaneous machinery no end. I have for more than twenty years been in the habit of studying machines in their principles, of designing machinery of many kinds, with reference to its improvement, and have taken out several patents for my own inventions. I have often been requested to act as expert witness in patent causes, and have sometimes so acted, but have generally declined until within the last three years, when I have made it my leading occupation, and have since been almost constantly employed with such work with some employment as consulting engineer.

Int. 2. Have you examined reissued letters patent No. 7014, dated March 28, 1876, for an improvement in nailing machines for boots and shoes, and do you understand the same and the invention therein described.

Ans. I have read and examined said reissued letters patent, and I understand the same and the invention therein set forth and described.

Int. 3. State generally what you understand to be the nature of the invention therein described.

Ans. In the most general terms the invention relates to certain improvements in mechanism for uniting the soles of boots and shoes to their vamps, or uppers, by means of nails, which, in the operation of the machine, are driven through the outsole—that part of the upper which in lasting is made to overlap the insole, and to be covered by the outsole—and the insole, thus uniting the whole firmly together. Previous to the invention described in said patent machines were well known, and more or less used, by means of which nails of uniform length could be passed from a nail trough or receptacle into a nail tube, and while sustained in an upright position in the nail tube could be driven down by a driver passing through the nail tube, said driver being made to act either by pressure or percussion. Machines are also well known by means of which nails of varying length could be cut off from a continuous wire, and driven through a nail tube by means of a driver through the outsole, the upper, and the insole as above described. This last-mentioned class of machines will probably not interest us
10 further in this case. Machines of the class first mentioned were capable of using nails from a single receptacle only. If it

became necessary or desirable to use nails of different length, it was necessary, in order to accomplish that purpose with these machines, to stop the machine to take out the nails then in the trough or receptacle, and to put in their place other nails of the desired length, and to repeat this operation as often as a change of length should appear so desirable as to demand this slow and costly process. It is obvious that in many kinds of boots and shoes the variation in thickness in different parts of the sole, as at the heel, the shank, and the ball, would require one or more such changes for every boot or shoe nailed, in order to insure satisfactory fastening of the sole by the use of nails of suitable lengths in all its parts, and that such changes must cause great delay, if made as often as desirable, while the omission to make such changes in order to avoid delay would compel the use of nails of unsuitable lengths in some parts, and result in imperfect work. Any arrangement, therefore, which would permit the use of nails of different lengths without serious interruption of the regular march of the machine would obviously be a great improvement upon any machines of this class previously known, which may be called single-nail machines, because permitting the use of nails of only one length without interruption.

This is the great underlying invention covered by said reissued patent No. 7014, as set forth in the following words in the specification of said patent:

"This invention consists, primarily, in the combination in a nailing machine, and with its nail tube and driver, of nail receptacles, two or more, adapted to receive and support nails of different lengths, to be used in different portions of the stock, according to the length of nail required."

"This primary purpose and underlying invention is also clearly set forth in the first, second, third, and fourth claims of the patent, as follows:

"We claim—

"1. In a nailing machine, the combination, with the nail tube and driver, of nail receptacles adapted to receive and support separate nails of different lengths.

"2. A series of nail receptacles adapted to sustain nails of
11 different lengths, and with or without heads, in combination with a carrier to remove a nail from either of the receptacles to a position in line with the driver by which it is to be driven, and with a driver to drive the nail from the carrier.

"3. A series of nail receptacles adapted to sustain and guide separate nails of different lengths, in combination with a nail tube and driver, and with mechanism to present the nails singly to the nail tube in line with the driver, substantially as described.

"4. The nail tube and driver and receptacles to contain separate nails of different lengths, in combination with mechanism adapted to select the nails to be driven, according to the thickness of the stock to be united, substantially as described."

This, then, it clearly appears, is the great, distinctive, underlying invention of McKay and Fairfield, embraced, described, represented,

and claimed in their said patent, namely, a machine for securing the soles of boots and shoes to their vamps or uppers by nails driven through outsole, upper, and insole, such machine having more than one receptacle—"two or more receptacles"—for nails, so that nails of more than one length—two or more lengths—might be used in such succession, or in such order, or at such times, or in such parts of the circuit of the sole, as in the judgment of the operator or adjuster of the machine the work in hand should require, without seriously retarding the continuous operation of the machine.

One practicable train of mechanism for determining the particular receptacle from which a nail should at any given instant be drawn, and for conveying the selected nail from its special receptacle to the nail tube to be driven, is clearly shown and described in the "box or carrier t," with its "two cylindrical parts or rings, * * * the outer ring f^2," with its "vertical slot g^2, extending through the (outer) ring nd to the outer surface of the inner ring, in which surface is made a vertical nail-carrying groove, h^2, that forms a part of the nail tube when the parts are in position to bring the groove into line with the nail tube."

It does not seem to me necessary, to the completeness of this answer, to follow out in detail the other features of this invention, since they are all subsidiary to the main invention above set forth, and constitute one train of mechanism for accomplishing the main object of the invention; and this mechanism may be replaced
12 by any mechanical equivalents without impairing the integrity of the combinations set forth in the claims above recited (pp. 10, 11, *supra*). The special features of this train of mechanism, by means of which the selection of one nail of required length from among nails of six different lengths in six separate nail receptacles is made automatically, at the will of the operator or adjuster of the machine, the will of the operator or adjuster being expressed in the adjustment of the parts of the selecting and carrying mechanism, said nail receptacles being, as represented in said patent, stationary with the frame, are all clearly set forth in the specifications and drawings, and distinctly claimed in the fifth and sixth claims of said patent.

The omission of the automatic feature of the invention—compelling "the will of the operator" to be exerted at every new selection of a nail of different length from the one last driven—while it would relieve a machine from which this automatic feature was omitted from the fifth and sixth claims, would not relieve it from the first, second, third, and fourth claims, if it did contain more than one nail receptacle capable of supporting nails of more than one length, with the combination, set forth in said claims.

Discarding one or more of the six receptacles would not relieve it so long as it contained more than one. The substitution of other devices for the carrier by which the selected nail is transported from the nail receptacle to the nail tube would not relieve it so long as such substituted carrier should be a mechanical equivalent for the discarded one, and in combination with more than one receptacle for nails of different lengths. Arranging the nail receptacles parallel to

each other, instead of radially around the axis of nail tube and driver, would not relieve it, would not affect the combination, so long as there were more nail receptacles than one combined with "the nail tube and driver" as in the first claim; with "a carrier," as in the second claim; "with mechanism to present the nails singly to the nail tube and driver," as in the third claim, and with "mechanism adapted to select the nails to be driven according to the thickness of the stock to be united," as in the fourth claim. Causing the relative motion between the nail receptacles and the point of delivery into the nail tube to take place by making the said point of delivery
13 stationary and the receptacles themselves movable, whether by revolving around the axis of nail tube and driver or by sliding along a line tangent to a circle concentric with said nail tube and driver, would not affect the combination, so long as there were more nail receptacles than one supporting nails of different lengths, to be selected at the will of the operator, whether by an occasional act of adjustment or by an act of adjustment frequently repeated, combined as set forth in the first, second, third, and fourth claims of said patent, with said devices or their mechanical equivalents. In a word, in so far as relates to the employment of two or more nail receptacles for supporting nails of different lengths, in the class of machines referred to in said patent, it seems to me that said patent, in view of the state of the art as it then existed, is a foundation patent, and that the invention therein described fairly embraces all mechanical equivalents for the particular mechanism described, which may be substituted therefor to accomplish the purpose and secure the effective operation of this important improvement, of which these patentees appear to be the original and first inventors.

Int. 4. Have you seen and examined a machine for securing the soles of boots or shoes to their vamps or uppers, marked as having been made by the Kimball Clinching Screw Machine Association, and do you understand the same?

Ans. I have seen such a machine, both in operation and standing still, at Walker's shop, in Milford, and I do understand the same. I have also examined in the reports and "Official Gazette" of the Patent Office all the patents under which said machine was said to have been made, as the numbers and dates of said patents were set forth on a plate attached to said machine.

Int. 5. Please state whether or not said machine embodies any of the inventions and improvements described and claimed in said reissued patent No. 7014; state fully and give the reasons for any opinion you may express.

Ans. In my opinion, said defendants' machine does embody and contain important inventions and improvements described and claimed in first, second, third, and fourth claims of said reissued patent No. 7014. Defendants' machine has two receptacles
14 for nails, which may be, and practically are, nails of two different lengths.

These nail receptacles are separated from each other by a vertical partition in a stationary case of approximately hemispherical form,

situated at a little distance from and in rear of the nail-driving mechanism, and a little higher than the point of delivery into the nail tube. The space between these nail receptacles and said point of delivery, some five inches, is occupied by two nail carriers, parallel, side by side, slightly inclined downward toward the point of delivery, to which each in its turn is brought into close proximity and accurate adjustment.

Near their upper or higher end is fastened a rectangular metal plate, which shares the lateral movements of these nail carriers, and by moving always in contact with or in close proximity to the face of an opening in the front of the nail receptacles, a little below its centre, keeps said opening always closed, so as to prevent the escape of nails from the receptacles to fall upon the floor, while leaving the upper end of each nail carrier in open communication with its appropriate nail receptacle. The two connected parallel nail carriers, called in Joseph E. Kimball's patent, No. 205,652, "nailways," are made "laterally adjustable" by being both attached to a metallic slide fitted to move transversely in ways so that either one of said nail carriers or laterally adjustable nailways may be brought at pleasure into position to deliver its nails into the nail tube to be driven. Suitable mechanism at the proper time separates the foremost nail of those in the nailway set for delivering nails to the nail tube from the one next to it and passes it into line with the axis of the nail tube and driver; and at the proper moment the driver is "tripped" or set free from a catch, and is forced down by a powerful spring.

There is an intermediate stop which secures the laterally adjustable nailways against motion while delivering a nail, and permits motion at all suitable times. The lateral motion, when called into play, is given by the foot of the operator on a pedal, moving the nailways or nail carriers in one direction, and by a spring moving them in the opposite direction. There is a mechanism inside of the nail receptacles called in said Kimball's patent a "hopper," or, rather, inappropriately, "nail distributer" (since the distribution is done by hand, by putting into each compartment of said hopper, *i. e.*, into each nail receptacle, its own separate nails, all of the same length, into each compartment, but different in the two compartments), by which the nails are tossed up so as to fall into a trough attached to each nailway, having such inclination towards the front ends of the nailways or nail carriers as to cause them to slide along down, their points and all but their heads dropping through a slit, through which their heads will not pass, so that they hang suspended by their heads with their points pendent. Passing down in this manner to and into the nail carriers or nailways, in which they hang suspended in the same manner, their motion facilitated by light and rapid blows of hammers on each side of the nail carriers provided for the purpose, they are taken from one or the other of the nail carriers (from whichever one is set in the proper position for delivery), the entire row following down one nail's breadth in that carrier each time one is taken out to be driven, but remaining stationary in the other nail carrier until that is called

into action in its turn, when the nails in the first become quiescent until brought back into use. If, in any given case, the sole were throughout of uniform thickness, and the nails in one of the receptacles were deemed by the operator of suitable length for the purpose, he would set the nail carrier so that it should continue to deliver nails of constant lengths from that receptacle all around the sole, those of another length, whether longer or shorter, all this time remaining quiescent in the other carrier and receptacle.

If, now, another shoe, having a sole also of uniform thickness, but of a thickness different from the one last nailed, be given the operator, he would, if the nails, before unused, were found of suitable length, bring the other nail carrier into position for use, and proceed with these nails as before with the others. If neither of the two receptacles contained nails of suitable length for a shoe which must be nailed he would be obliged to empty one of the receptacles and one of the carriers and to fill both with nails of suitable length. Again: if a shoe be now given him to nail having two thicknesses of sole leather in the outsole at the ball of the foot and only one at the heel and shank, and he judged the nails in the two recep-
16 tacles to be of suitable length for these two thicknesses, respectively, he would begin in the shank with nails from the receptacle containing the shorter nails, continue on around the heel and along the shank on the other side until he came to the beginning of the extra thickness at the ball; he would then, by placing his foot on the pedal, bring the carrier containing the longer nails (and communicating with the receptacle containing the longer nails) into action, at the same time and by the same motion relegating the first-used carrier to inactivity, pass around the ball and toe with the longer nails, until, on reaching the place where the extra thickness terminated, he would, by removing his foot from the pedal, permit the spring to restore the first-used carrier with the shorter nails to position for use, the other being simultaneously thrown out, when he would complete the nailing to the place of beginning with the shorter nails with which he began. If, finally, a shoe be given him requiring nails of two different lengths in different parts of its sole, but nails differing in length from those last used, he must empty the receptacles and carriers of the unsuitable nails and replenish them with such as he deems suitable.

Now, it is perfectly obvious, from this description of defendants' machine and of its operation, that it infringes claims 1, 2, 3, and 4 of complainants' reissued patent No. 7014 in the following particulars:

1. It infringes the first claim in that it contains precisely the same elements, combined in substantially the same manner for the same purpose, and is aptly and accurately described in the very words of said claim, to wit:

"1. In a nailing machine the combination, with the nail tube and driver, of nail receptacles adapted to receive and support separate nails of different lengths."

2. It infringes the second claim in that it contains a series of nail receptacles, namely, two nail receptacles, adapted to sustain nails of

different lengths of one of the two forms specified in the claim by the words "and with or without heads;" that is, in defendants' machine, adapted to sustain nails of different lengths, with heads, in combination with a carrier to remove a nail from either of the receptacles to a position in line with the driver by which the
17 nail is to be driven, "and with a driver, to drive the nail from the carrier."

Defendants' machine has receptacles adapted to sustain nails of different lengths with heads, in combination with a carrier for each receptacle, to remove a nail from either of the receptacles to a position in line with the driver by which it is to be driven, and with a driver to drive the nail from the carrier. The language of the second claim, therefore, accurately describes corresponding elements and a combination substantially the same to be found in defendants' machine.

3. It infringes the third claim, in that it has "nail receptacles adapted to sustain and guide separate nails of different lengths, in combination with a nail tube and driver, and with mechanism to present the nails singly to the nail tube in line with the driver, substantially as described" in complainants' patent.

The elements are identical or equivalent, the combination is substantially the same, the operation is altogether similar or equivalent, and the result is, in my opinion, a palpable infringement of the third claim of complainants' patent of the corresponding parts of defendants' machine.

4. It infringes the fourth claim of complainants' patent, in that it contains "the nail tube and driver and receptacles to contain separate nails of different lengths, in combination with mechanism adapted to select the nails to be driven, according to the thickness of the stock to be united, substantially as described."

That the selection is made by the direct application of the foot of the operator in defendants' machine, while in the patent of complainants it is made automatically, does not affect the combination covered by this fourth claim, inasmuch as the pedal arrangement of defendants is "mechanism" as well "adapted to select the nails to be driven according to the thickness of the stock to be united" as is the particular form of mechanism described in complainants' patent.

Further, the mechanism and its operation are substantially the same in both, because in both it consists of a device for causing the carrier to select and convey from the appropriate nail receptacle to the nail tube a nail of length suited to the thickness of stock to be united. Complainants' patent being, as I have already ob-
18 served, a foundation patent as to devices for selecting from separate receptacles nails of different lengths, the words "substantially as described" have a broader meaning than they would have in a patent for improvement in the form of well-known devices.

The term "nail carrier," as used in complainants' patent, sufficiently explains itself by its plain, ordinary signification. It is a piece of mechanism adapted to carry nails from the receptacle to the

nail tube, and to deliver them one at a time, as required, to said tube to be driven.

In complainants' machine this "nail carrier" is a ring having a slot to receive a nail from any one of the receptacles opposite which it may be arrested at the proper time, in which slot it may be conveyed, by a partial revolution of the ring, to a groove in the cylindrical surface within the ring, forming a part of the nail tube, having in its exterior as many notches as there are receptacles, by means of which it may be set so as to receive a nail from any one of the several receptacles. It answers the purpose of a "carrier" for each and all of the receptacles.

Adjourned.

BOSTON, *June* 19, 1880.

Witness continues:

This nail carrier in defendants' machine consists of "nailways" fixed parallel to each other upon a sliding block having lateral motion to bring either one of the "nailways" into position to deliver a nail to the nail tube. Having as many nailways as there are receptacles it answers the purpose of a nail carrier from each of the receptacles. The variation of form introduces no new or useful function or operation, and does not affect the substantial identity of the two devices. I am therefore of opinion that the selecting and carrying mechanism in defendants' machine is substantially like that described in complainants' patent, and a full, mechanical equivalent therefor, and that defendants' machine is a plain infringement of the fourth claim of complainants' patent.

For the reasons above given in detail I am of opinion that defendants' machine clearly infringes claims 1, 2, 3, and 4 of complainants' said patent reissue No. 7,014 as to all the matters and things set forth in said claims respectively.

19 Int. 6. Have you examined letters patent of the United States No. 163,474, granted to Louis Goddu, dated May 18, 1875, for "Improvement in machines for nailing shoe soles from nail strips," and do you understand the same?

Ans. I have read and examined said patent, and I understand the same and the invention therein set forth.

Int. 7. State generally what you understand to be the nature of the invention therein described, particularly with respect to mechanism for selecting from two sets of nails of different lengths the one judged to be best adapted in length to the thickness of stock into which it is to be driven.

Ans. This patent relates to improvements in machines for nailing boots and shoes with nails cut from a strip fed by such machines and driven into the stock. The improvements relate principally to mechanism for permitting the selection by the operator of nails from either one of two strips of different widths, the nails cut therefrom being therefore of different lengths, in order that the nails used in all cases might be better adapted in length to the particular work in hand than where one length of nails only was available. This mechanism is very fully and clearly shown in the twelve cuts ac-

companying the patent, and as fully and clearly desribed in the specifications.

Passing over, as irrelevant, all that relates to the cutting mechanism, by means of which a nail is severed from a strip of suitable cross-section and width, and formed by pressure into a shapely nail within the nail tube, which is to guide and sustain it while the driver is driving it into the stock to be united, we come to the selecting and shifting mechanism, by means of which the strip from which a nail is to be cut is selected, cut, and driven. The carrier for the nail strips, marked "A" on the present drawings, has two channels, ways, or guides for two nail strips of different widths entering in the rear, at some little distance apart, and converging, by a curved path, so that at the front where they deliver the strips to the jaws for cutting off a nail the two channels are quite close together. Having a vibratory motion on a strong vertical axis, either one of the two channels may be brought, at the pleasure of the operator, so as to deliver a nail's width of the wider or narrower strip to the jaws, to be cut, pressed into a nail, and driven home. Suitable feeding rolls are provided, and provision is made that the changes from one channel to the other shall be made only at such times as the strips shall be free from the cutting jaws, so that there may be no impediment to their motion. The nail strips may, therefore, be considered as strictly equivalent to rows of nails in complainants' patent and defendants' machine, to be separated from each other and admitted to the nail tube, to be driven as required by the work in hand. In all that relates to the use of nails of more than one length, to separate receptacles for such nails, to mechanism for selecting nails of length best adapted to the work to be done, to a carrier for transporting the selected nail to its place in the nail tube ready for driving, this mechanism is equivalent to corresponding mechanism for similar purposes in complainants' patent reissue No. 7014.

Int. 8. Have you compared the mechanism shown and described in said patent No. 163,474, and especially that described and referred to in the sixteenth claim of said patent, with the defendants' machine? If so, please state the results of such comparison.

Ans. I have made the comparison inquired about in the question, and find, necessarily, that since both are, as to the selecting mechanism by means of which nails of different lengths are selected and carried from separate receptacles to a tube to be driven, and in their combinations with the other operative parts, equivalent to complainants' patent reissue No. 7014; they are also equivalent to one another. Indeed, in some formal but not essential particulars, the resemblance between the Goddu patent under consideration (No. 163,474) and defendants' machine is very striking. In both the nail carrier is moved laterally, to present the nail of required length to the nail tube; in the one case, it is true, by a vibratory motion, and in the other by a lateral sliding motion. In both cases two lengths of nails only are used. In both cases the selection and adjustment are made each time directly by the operator. In both cases there is provision against movement of the selecting mechanism at

a time when, by reason of the other functions of the machine, such motion would be disastrous or inconvenient. There are marked differences, it is true; but in all that is embraced in the sixteenth claim of patent No. 163,474 said claim clearly covers, in my
21 opinion, the corresponding devices and combinations embodied in defendants' machine.

Said sixteenth claim is in the following words:

"16. The combination, in a nailing machine for boots and shoes, of a vibratable nail-strip carrier, A, and the slide-bar B, with a device for applying the changing force to shift such carrier, irrespective of the operation of the jaws, whereby an automatic shifting movement of the nail-strip carrier is effected, previous to the feeding and cutting of the next nail, and without arresting the action of the machine, and without regard to the action of the jaws, substantially as herein set forth."

Int. 9. State whether or not, in your opinion, the said Goddu patent No. 163,474, dated May 18, 1875, describes a useful and practical machine; and whether or not a mechanic of ordinary experience and skill in the art could construct a machine from the description contained in the specification and drawings of said patent.

Ans. Said patent does describe a useful and practically operative machine. The drawings are numerous (there are twelve cuts, besides two cross-sections of nails marked "Z"); they are very clear, coherent, and complete, so far as the mechanism described in the patent is concerned. They are not working drawings—patent drawings seldom are—but contain abundant evidence that they were made either from full working drawings or, as is more probable, from a completed machine taken apart for the purpose. They contain no dimensions and no scale, but seem to be pretty carefully drawn to a scale, though it is probable that some of the smaller parts are slightly enlarged for the sake of clearness.

The description is very full, clear, and complete, and constitutes a perfect specification of the invention. Taken all together, the specification and drawing would enable any competent mechanic skilled in the art of making nailing and pegging machines, as the same existed at the date of said patent, to make working drawings and to construct thereby a useful and practically operative machine exactly embodying the invention described in said patent, without the exercise of any invention and with no more than ordinary skill.

(The complainants here put in as evidence a copy of said letters patent reissue No. 7014, dated March 28, 1876, issued to Gor-
22 don McKay, as the assignee of Gordon McKay and Hadley P. Fairfield; also a copy of letters patent No. 163,474, dated May 18, 1875, issued to the American Cable Screw Wire Company, as the assignee of Louis Goddu, and the same are marked respectively "Complainants' Exhibit No. 1, H. C. M., sp'l ex'r," and "Complainants' Exhibit No. 2, H. C. M., sp'l ex'r.")

(Adjourned.)

BOSTON, *June* 21, 1880.

Cross-examination by JAMES E. MAYNADIER, Esq., of counsel for defendants:

Cross-int. 10. In one of your answers you express the opinion that "the substitution of other devices for the carrier by which the selected nail is transported from the nail receptacle to the nail tube would not relieve" a machine from certain claims of the McKay and Fairfield reissue under certain circumstances. Do you think that the total omission of the carrier by causing the nail tube to move from under the driver to the mouth of the nail receptacle and there to receive a nail directly from the nail receptacle and then to move back again under the driver would relieve a machine from all the claims of the McKay and Fairfield reissue, as you understand them?

Ans. I think the total omission of any carrier from the combination would be fatal to the combination, and a machine characterized by such omission could not be said to embrace the combination or combinations described in complainants' patent, in which a nail carrier is an element. But calling a nail carrier by another name would not have this effect.

Cross-int. 11. Do you not think that the defendants' machine has two separate and distinct nail carriers, only one of which can operate at any given time, and each of which contains a large number of nails, one carrier containing nails of one length only and the other nails of another length only? and, if yea, is it not clear to you that these two separate and distinct carriers each differ materially from the single carrier of McKay and Fairfield, which can receive but one nail at a time, which travels one distance and receives one length of nail and a different distance to receive a different length, and whose office is to take one nail at a time from
23 any one of two or more receptacles and carry that nail over the nail tube and under the driver?

Ans. To the first part of the question I answer affirmatively. The defendants' machine has two distinct nail carriers, though they can hardly be said to be separate, since they are both fastened firmly to one solid block and move together; but they do operate in the manner described in the question—that is, they move laterally, so as to bring either one or the other of these two nail carriers into position to deliver nails one by one to the nail tube to be driven, the other nail carrier being idle when the one is so occupied. There is a difference in form between this and the carrier in complainants' patent, which, as truly stated in the question, does move one given distance to obtain nails of one given length for transportation to the tube to be driven and another given distance to obtain nails of another given length for the same purpose, and does take, transport, and deliver one nail at a time. Defendants' machine, on the other hand, performs the carrying by two actions, namely, by transporting laterally a whole row of nails, and by delivering nails in single file from the carrier as required, and in so far there is a difference in the mode of operation as well as in the form of the parts; but it

seems to me that the function, which is the selection and transportation of nails of either one of two or more lengths, one at a time as required, from separate receptacles to a nail tube, in combination with such nail tube and a driver, is identical in the two machines, and that the device in defendants' machine is a fair mechanical equivalent for the corresponding device in complainants' patent, none the less on account of the very marked difference in form. In so far as defendants' device might be an improvement upon complainants' device, it would seem to me to possess patentable novelty, subject to the earlier equivalent device.

Cross-int. 12. I see that you say that the driver in the defendants' machine drives the nail from the carrier; this is, in my opinion, an error. Please reconsider this. Is it not the fact that the driver never enters the carrier, or any part of it, in defendants' machine?

Ans. I do not mean to be understood that the driver enters the carrier, but that the end of the carrier is brought by the
24 lateral motion into close proximity with the nail tube, when, as I have somewhere said in my deposition, suitable mechanism separates the foremost nail from the one next to it, pushes it into line with the tube and driver, when, at the proper moment, the driver is liberated from a catch, descends by the force of a powerful strained spring, and drives the nail, which has been delivered from the carrier through the tube into the stock to be nailed.

Cross-int. 13. You say in one of your answers, "defendants' machine has receptacles adapted to sustain nails of different lengths with heads, in combination with a carrier for each receptacle, to remove a nail from either of the receptacles to a position in line with the driver by which it is to be driven, and with a driver to drive the nail from the carrier." Do you think the driver has anything whatever to do with removing the nail from the carrier in defendants' machine, and is not the nail removed wholly from the carrier before it is struck by the driver?

Ans. The driver in defendants' machine takes no part in removing the nail from the carrier and does not act in combination with the carrier in removing the nail from the carrier, but it does act in combination with the carrier in driving through the outsole, upper, and insole a nail of selected length, brought by a carrier from one of two or more receptacles adapted to support and contain nails of different lengths, each part which forms an element in the combination performing its own appropriate function—the receptacles receiving the nails of separate lengths, the carriers carrying the nails of selected lengths, and the driver driving selected nails. It is also true of complainants' patent that a nail has to be pushed out of the slot in the carrying ring into a niche or recess in the interior ring before it is in position to be driven by the driver. This is exactly such a motion as I have described in defendants' machine, by which a nail is pushed forward from the carrier into line with the nail tube and driver. There are differences, of course, easily pointed out; the devices are not identical, but I believe them to be, as to the combination described in complainants' patent, strictly equivalent.

Cross-int. 14. Does not the fact that the driver has nothing to do

with driving the nail from the carrier in defendants' machine make it necessary for you, in your opinion, to materially alter the
25 statement that "the language of the second claim" (of the McKay and Fairfield reissue) "accurately describes corresponding elements and the combination substantially the same to be found in defendants' machine?"

Ans. Upon very careful consideration I cannot see that it does. The words at the end of the second claim in complainants' patent, "and with a driver to drive the nail from the carrier," must be so construed as to do no violence to the facts of the combination as shown, since they can be so construed without violence to their plain meaning. The driver in complainants' machine does literally drive the nail out from the carrier; the nail must be already out of the outer ring f^2 of the carrier—that is, from that part of the carrier and in the groove in the inner ring of the carrier which forms a part of the nail tube—before the driver can hit it. The nail has been received from the outer ring of the carrier by the inner ring, and must then be transported into line with the driver before it can be driven. There is, then, this difference in the two mechanisms, that in complainants' machine the nail carrier forms a part of the nail tube or a combination upward of the nail tube, while in defendants' machine the nail carrier comes only in close proximity to the axis of the nail tube. This seems to me to be a subordinate difference in the mode of carrying out the combination rather than a substantial difference in the combination itself.

Cross-int. 15. In your description of the nail carrier in complainants' machine, near the end of the fifth answer, it seems to me that you have considered the outer ring f^2 and its slot g^2 as the means for carrying the nail from the receptacles v around the inner ring or cylinder to the groove h^2, which is, I think, the nail carrier proper, this groove h^2 remaining stationary; am I right in this? And, if so, are you not in error? That is to say, is not the nail received directly from one of the receptacles v, through the slot g^2 and the outer ring f^2, and into the vertical nail-carrying tube h^2 in the inner ring or cylinder of the nail carrier—the mouth of that groove, h^2, being then closed by the outer ring, f^2, and the inner ring or cylinder, which is the groove h^2, then moved upon its axis, so that the groove h^2 leaves the mouth of one of the receptacles v, and
26 travels with the nail in it until it is stopped in line with the nail tube and directly under the driver?

Ans. My description was not as full as it might have been. I was considering the relative, and not the absolute, motion. My language, therefore, in the answer referred to, is ambiguous, by omission, at least; the nail carrier is distinctly said to be and shown to be in two cylindrical parts or rings; the outer ring, f^2, may be termed the selecting position of the carrier, its outer surface coming in contact with the mouths of the receptacle, its inner surface coming in contact with the outer surface of the inner ring, and its slot g^2 delivering nails into the groove h^2, in which they are transported by the turning of the inner ring into line with the driver. I therefore answer the question in general affirmatively, and sub-

mit this more minute description as the modification of my answer, required for a more complete and exact description of the mechanism.

Cross-int. 16. Do you not think, on reflection, that the nailways that you call the nail carriers in the defendants' machine resemble the troughs or receptacles *v* of the McKay and Fairfield reissue much more nearly than they resemble the nail carrier or nail box *t* of that reissue?

Ans. Certainly; in form, very much more; and it was only after considerable reflection that I perceived their real character. They were more disguised by the fact that the nail receptacles proper are called in one of the defendants' patents embodied in the defendants' machine nail distributers, or, taken collectively, "a hopper or nail distributer."

On careful consideration I discovered that this hopper was not a nail distributer in any sense whatever. It had two receptacles entirely distinct—each having a door to put nails in at, and a mode of delivery into the nailways, which I call carriers—not because nailway is not a perfectly appropriate term, but because their function is that of carrier and nothing else.

Whatever nails may be put into one of the receptacles, whether all of one length or of mixed lengths, will come out without distribution or selection in the nailways, and will be carried in their turn to the nail tube to be driven. The radial nailways or receptacles of complainants' patent are real receptacles—nails must be
27 put into them initially; they have no function in common with the nailways of defendants' machine, although, in performing their own proper function, they do pass nails along down in single file in a manner very similar to that by which part of the carrying operation is performed by defendants' nailways. Nails are in both machines carried from receptacles to a position for driving, and the mechanism which does this carrying in each machine I have called a carrier, supposing that a nailway may be a special carrier as well as a railway may be a common carrier.

Cross-int. 17. Did you ever see the machine described in the McKay and Fairfield reissue in practical operation?

Ans. I never did, to my recollection.

Cross-int. 18. How long do you think the cutters $j j^2$ of Goddu's patent, No. 163,474, would last in practical operation?

Ans. Well, I think they would be rather troublesome to keep in repair.

Cross-int. 19. Did you assume, in testifying as to this Goddu patent, that Goddu was the first to patent a machine with two or more ways, either capable of being brought into operation at pleasure, or did you know that such machines were known for several years prior to '75?

Ans. I assumed that, in respect to the matter inquired of, it was subject to previous inventions.

Cross-int. 20. The sixteenth claim of the Goddu patent is, as I believe, a combination of several elements, one of which is "a device for applying the changing force to shift such carrier, irrespective of

the operation of the jaws." Please state how the parts composing such device are lettered in the drawings of the Goddu patent; that is to say, name all the parts and give their letters which you think constitute that device.

Ans. There is a piece lettered p, called a triangular driver in the specification, which is pivoted to the frame. At the front corner of the triangular driver there is a notch, q, to receive a tooth or projection, q^2. This tooth q^2 is formed upon one side of a cylindrical sliding piece or "slide bar," B. This bar B has upon the opposite side and towards the farther end from q^2 another tooth, r^2.

28 Both these teeth are formed within the cylinder by cutting away adjacent parts.

This tooth r^2 engages in a suitable notch in the "strong back piece i," which rises from the rear end of the carrier A. Now, when the triangular driver p is partially rotated upon its pivot it moves the slide bar B by means of the notch q and the tooth q^2, and the slide bar B moves the back piece i, and with it the rear end of the carrier A, causing said carrier to rotate about its strong vertical axis G, and giving to the front end of said carrier A a diminished vibratory motion, which, when the machine is in proper adjustment, is just sufficient to bring either one of the nail strips into proper relation with the cutting jaws.

Returning, now, to the triangular driver p its base, opposite the notch q, is concave and terminated at each corner by short projections or ears, $s\ s$; a lever marked t is also pivoted to the frame in rear of the triangular driver p. This lever, called a shifting lever, t, has a sliding piece, a, which the patentee calls a "bearing tongue," acting upon the concave rear surface of the triangular driver p, being pressed into contact therewith by a spiral or coiled spring placed behind it in a hole in the lever t abutting at the farther end against the screw screwed into said hole. This pivoted lever t is operated by a handle, v, extending from its side, and the limit of its vibration, as well as that of the pivoted driver p, is determined by the throws of the nail-strip carrier, etc. For the operation the lever v, being set by hand, at any stage of the operation of the machine, will cause no vibratory motion of the nail carrier when the jaws are cutting a nail, but merely set the parts into such a position that the nail carrier will be vibrated as soon as released, so that while the indication of a change is given by hand the change itself is said to be automatic. It is set at any time to move at the proper time, and when the proper time comes it moves.

Cross-int. 21. The nail strip projecting from one of the ways between the jaws is all that prevents the motion of the carrier A, under the influence of the coiled spring and the lever t, is it not?

Ans. It is, as I understand it.

Cross-int. 22. There is nothing at all resembling this in

29 the defendants' machine, is there? I mean the projection of anything from the mouth of either of the nailways to prevent the motion of the piece in which the nailways are formed.

Ans. No; there is nothing projecting from the mouth of the nail-ways to prevent their lateral motion at any time.

Cross-int. 23. Did you ever see the machine described in the Goddu patent, No. 163,474, in practical operation?

Ans. I never did.

Cross-int. 24. Did you ever see either of the machines described in the McKay and Fairfield reissue on the Goddu patent?

Ans. I cannot say that I ever saw the McKay and Fairfield machine. I have been a very frequent visitor at the shop of the McKay Company, and have seen a great many nailing machines in various stages of progress and undergoing endless mutations. I do not recollect ever to have seen either of the machines.

Cross-int. 25. Did you ever have anything to do personally with the practical operation of nailing machines or the building of nailing machines for practical use?

Ans. I had during about one year (1865 or 1866) charge of the business of the McKay Sewing Machine Company, including the nailing machines, and used to be two or three times every week in consultation with the designer and draughtsman, and other men in the shop, about the nailing machine. That is my only connection with them except as a spectator.

Cross-int. 26. At that time the McKay Sewing Machine Company had not got any nailing machine into practical use, but were attempting to get up one that they could recommend to the trade; is not this the fact?

Ans. Not quite. There were, while I was there, two or three of the Blake nailing machines—I cannot say in general practical use, but operated experimentally for long, continuous periods. There were corrugated wire machines, the wire being cut to various lengths as automatically determined by the machine itself to suit the thickness of the stock.

Direct examination resumed:

Int. 27. Referring to your answer to cross-int. 22, state whether or not there is any reason why lateral motion of the nail carrier or nailways in the defendants' machine should not take place at any particular time, and whether any provision is made in that machine to prevent such motion, and how far it therein corresponds to or differs from complainants' machine.

Ans. There is good reason why such lateral motion should not take place in defendants' machine at a time when a nail is moving from the carrier into position to be driven. The nail in passing might at some instant obstruct the motion; at all events the motion would disturb the placing and driving of the nail. It was therefore necessary to provide a stop which should act intermittently to prevent motion at inconvenient times, and to permit it at all other times. Such a stop is provided in defendants' machine, and is a pin which is alternately pushed in to lock the parts, and withdrawn to leave them free when the motion is desirable and unobjectionable.

This, it will be seen, is equivalent to the action of the nail strip in Goddu's machine before a nail is severed.

The nail strip itself serves as a stop in the Goddu machine, and a special stop is provided in defendants' machine.

J. C. HOADLEY.

It was agreed that the machine referred to in Mr. Hoadley's testimony, as seen by him in Walker's shop, Milford, is the same as the machine used by the defendants, to enjoin the use of which this suit was brought.

Attest: HENRY C. MERWIN,
Special Examiner.

31 *Evidence for Defendants. Taken Pursuant to the Sixty-Seventh Rule of the Supreme Court of the United States, in Equity, as Amended, Before Me, William A. Copeland, Special Examiner.*

Present: Elias Merwin, Esq., of counsel for complainants; James E. Maynadier, Esq., of counsel for defendants.

Deposition of Henry B. Renwick.

Direct examination by JAMES E. MAYNADIER, Esq., of counsel for defendants:

BOSTON, *Nov.* 2, 1881.

Int. 1. What is your name, age, residence, and occupation?

Ans. Henry B. Renwick; age, sixty-four years; reside in city of New York; am occupied at present, and have been for many years last past, in matters relating to patents and patented inventions.

Int. 2. What experience have you had as expert in patent causes and kindred matters?

Ans. I have been examined as expert frequently during every year for the last twenty-five years or more in suits in which patents were in question. I have drawn many patents and reissues and have been much occupied with examination of machinery.

Int. 3. Have you examined letters patent No. 155,962, to McKay and Fairfield, dated Oct. 13, 1874; Reissue No. 7014, Complainants' Exhibit No. 1, and No. 163,474, Complainants' Exhibit No. 2; the deposition of Hoadley, and the machine Exhibit Defendants' Machine, and do you understand the same?

(The patent No. 155,962 is put in evidence by defendants and marked "Exhibit McKay and Fairfield, Original Patent, W. A. C., N. P.," and the machine referred to is also put in evidence and marked "Exhibit Defendants' Machine, W. A. C., N. P.")

32 Ans. I have examined the patent No. 155,962 and the reissue thereof, No. 7014, and I understand the machinery described therein, with the exception of the mechanism for moving the spring, which, it is stated in the patents, pushes the nails into the carrier, and with the exception of the mode in which that spring works to perform the duty which it is said to perform. I have examined the patent No. 163,474, with especial reference to the combination of

mechanism referred to in the sixteenth claim thereof, and understand the construction and operation of the same. I also have examined the deposition of Hoadley, and understand Mr. Hoadley's testimony and the construction and way of working of the Exhibit Defendants' Machine.

Int. 4. State whether the machine described in the patent No. 155,962 and the reissue thereof will, without addition or alteration, operate to drive nails as described in the reissue.

(Objected to as incompetent.)

Ans. I have never seen a machine constructed in accordance with the specifications and drawings of the patents named in the question, and have asked counsel for defendants herein to put me in the way of seeing such a machine, and been informed that no such machine has been made. My opinion, therefore, is based upon a careful examination of the drawings and description and upon a pretty extensive knowledge of the construction and working of machines for handling screw blanks and partially-formed screws, and for making and sticking pins. In this machine what are called the nail receptacles, when they are so constructed as to carry headed nails, are exactly like the inclined ways which are used to support screw blanks and pins in screw and pin machinery, and the contrivance called in the patent the "carrier" is much like some of the devices used in such machinery, although, so far as I now remember, such devices in screw and pin machinery reciprocated in straight lines and not in the arc of a circle, as the carrier in the patents in question does. The first difficulty that I see in the operation of the machine would be that the carrier groove marked "h^2" in the Fig. 4 of the patent would not transport a nail from the nail receptacles to the place where it is to be driven, even if the nail could be got into it when it was opposite the open end of one of the nail receptacles.

33 In order that a nail should be got into it at all this groove must receive the nail loosely—that is, be of sufficient size to admit the nail to enter it easily; and I can find no provision whatever in the patent to prevent this nail, after it has been received into the vertical groove h^2, from dropping out of said groove before the groove gets over the tube f and under the hammer. In my opinion, even if nails could be introduced into this groove, they would, in the operation of the machine, drop out on the floor before reaching the place where they are to be driven. Second, when headless nails are used the receptacles or nailways must have bottoms to them, as shown in the drawings, and the sides of the receptacles must be so far apart that the column or row of nails can move freely down the receptacle. The nails, whether pointed or with ends perpendicular to their length, would rest with their points, or ends which go first in driving, upon the bottom of the nail receptacle, and would consequently move thereon with a friction due to the weight of the nail and the shape of the point, and would be hardly at all resisted by the sides of the receptacle. Consequently nails in the column would, I think, incline with their tops towards the vertical wall of the carrier, so that their tops would fall into the

groove h^2, leaving their points in the receptacle. If this happen the machine would either break or be stopped, or the nail be cut in two.

Now, the patent states that the nail is to be pushed into the groove h^2 by a spring, i^2. I have before said that I cannot understand the mechanism by which this spring is actuated; but I do understand the patent to state, in substance, that when this spring is used with headless nails the upper ends of these headless nails are to project some distance above the tops of the receptacles in which they are held, and that the spring is to enter between the top of the lowest nail in the column and the top of the nail next above it, the spring passing over the top of the receptacle. I do not understand from the patent how this spring is to work to push the nail into the groove h^2; but, supposing that it did so act, it would act upon a small portion of the upper part of the nail only, and would therefore aggravate the difficulty before spoken of, namely, the knocking of the
34 top of the nail into the groove h^2, and leaving the bottom of it in the receptacle. When headed nails are used in the machine of the patent and reissue the ways are to be without bottoms and exactly like the receptacles or ways in screw and pin machinery and like the receptacles in the defendants' machine, in which the nails hang by their heads between two inclined parallel strips of iron. The patent describes an altered position of the pushing spring and its stock or carrier when headed nails are to be used, but there is no drawing of this altered position, nor can I understand how the spring is to be made operative on headed nails, even if proper contrivances were described for oscillating it in the manner described in the patent. When the spring is to work on headed nails it is to work on the parts thereof which are near their points. As in headed nails the friction is at the top and under their heads, this spring, if it could be made to work at all, would tend to push the points of the nails into the groove h^2 in the carrier, leaving their heads on the ways. I understand that nailing machines run from one hundred and eighty to two hundred revolutions per minute, and consequently drive that number of nails per minute, and at that speed I do not see how nails, either headed or headless, could be got out of the receptacles into the carrier without some mechanism to push the lowest nail of the column out of the receptacle into the groove of the carrier. As before stated, I cannot discover from the patents or drawings how the spring which is stated to perform that duty is operated; nor can I see that it would perform the duties required of it even if the mechanism for actuating it were properly described. For these reasons I believe that the machine described in the patent and the reissue would not work practically to drive nails as described without alterations and additions.

Int. 5. Mr. Hoadley, the complainants' expert, thinks, as I understand him, that the hoppers and nailways in defendants' machine are the equivalents of the receptacles v in carrier t of the McKay and Fairfield patents (see in particular his cross-int. 16, page 26 of the record), and that the mechanism described in the Goddu patent and referred to in the sixteenth claim of that patent is in the defendants'

machine, in substance. Please state your opinions as to those matters, giving your reasons.

35 Ans. In the defendants' machine there is a hemispherical hopper divided into two parts by a vertical partition, thus converting it actually into two hoppers. Nails of different lengths or nails of the same lengths may be placed in these hoppers, the longer in one, the shorter in the other. Each of these hoppers is provided with a door, so that nails may be thrown into it. This hopper is constructed open at its rear end, and the opening is closed by a flat circular disk, which is, in the operation of the machine, oscillated upon its centre by means of proper mechanism. This plate is provided with shelves or projections sticking out into the hopper, and, if this were the whole mechanism, the operation of the machine would be that the shelves would pick up nails from the mass of nails lying in the bottom of the hopper, lift them up until the shelf became so inclined that the nails would fall off again, and drop them down into the bottom of the hopper. This hopper is provided additionally with two nailways, or receptacles, as they are called in the McKay patent, one for each division of the hopper. These nailways project in a direction inclined downwards towards the head of the machine, where the nails are to be delivered to the driving punch or driver, and in these ways nails hang by their heads. These ways are capable of a slight vibrating movement in a direction perpendicular to their length, or nearly so, and therefore the hole through which they pass into the hopper must be a little larger than the ways. In order to keep this hole always closed there is a thin iron plate attached to the ways and sufficient in size to keep the holes always closed. On top of that part of both of the ways which is in the hopper and attached to the ways there is a trough without ends and with sides inclining upwards and outwards.

As nails are dropped by the shelves they fall into these troughs, and the form of the trough causes the nails to arrange themselves parallel with the length of the trough. When so parallel, or nearly so, the bodies of the nails drop between the two parts of each way, and their heads are caught by and rest upon the tops of the ways, the nails being in a single column in the ways, and they slide down these ways to the head of the machine. These ways are exactly the receptacles of the machine of the McKay and Fairfield reissue, support the nails in exactly the same way, and permit them to slide down in the same way that they do in the receptacles for

36 headed nails of that reissue. It is evident that the hoppers of the defendants' machine are not the receptacles of the McKay and Fairfield reissue, because those receptacles must be of such form that they will hold headed nails by their heads in a single column or row with all their points projecting downwards and with all their bodies substantially parallel to each other. Now, in the hopper of the defendants the nails lie in a mass with their heads and points in all directions, just as they are thrown in, and could by no possibility be picked singly out of that mass by the spring and carrier of the complainants' machine or any other carrier that I know of. There is no equivalent for these hoppers of the defendants

in the complainants' machines, nor for the shelves or projection which lift the nails out of it, and substantially such a hopper, with vibrating shelves and ways leading out of it provided with a trough, is old in screw machinery. In the use of the plaintiffs' machine the nails must be brought to it in a basket or pan and then they must be placed in the receptacles or ways by the fingers of an operator, and this pan and the fingers of the operator perform the same duty as the hopper and vibrating shelves of the defendants' machine. The carrier of the complainants' machine may be generally described as an instrument which receives the nails one by one at the end of one of the receptacles or nailways and transfers them (that is, provided it were so altered or added to as to work) to the locality where they are to be driven into the shoe sole. Now, the nailways of the defendants' machine are evidently the receptacles of the complainants' machine, and not the carrier which receives the single nails from the lower ends of the nailways or receptacles. The nailways hold a column of many nails, and the nails slide down these ways by the force of gravity. The carrier only holds one nail at a time and transports it by its own motion from one locality to another.

Now, referring to the patent No. 163,474, granted to Goddu, I find that it describes a machine for driving nails of varying lengths into a shoe sole, the length of the nail to be driven being determined by the operator. In this machine there are two receptacles, much like those in the machine described in the McKay and Fairfield patent for holding headless nails, and these ways or receptacles may be made to vibrate in a direction perpendicular to their lengths or
37 nearly so, as they do in the defendants' machine and in the machine described in the patent to Parker Wells, referred to in the Goddu specification. In the Goddu patent these receptacles support strips of metal, and not separate nails. Each of these receptacles is provided with a feeding device, which acts at intervals upon the feeding strip to cause it to project from those ends of the way which are nearest the head of the machine. In front of these ways there is a pair of jaws which act as shears and moulding jaws; these jaws act upon that part of the strip which is projected from the end of one of the ways, and are described as shearing it from the rest of the strip, and compressing it into the shape of the nail; this nail is afterwards, by means of proper machinery, to be driven into the shoe sole. Supposing that the strip from which nails are being cut is the wide one which furnishes the long nails, and that it becomes necessary next to drive a short nail; then the receptacle which carries the wide strip is so shifted that its mouth is no longer opposite the law, and the receptacle which carries the narrow strip has at the same time its mouth brought into line with the cutting jaws; consequently the next nail driven will be a short nail. If an attempt were made to move the ways while the strip projecting from one of them was between the jaws, before the nail was fully sheared off or before the jaws came together, the machine might be broken or injured; and in order to prevent the possibility of this occurrence the mechanism referred to in the patent and described in the sixteenth

claim thereof is provided. This mechanism is best shown in Fig. 12 of the drawing. This figure of the drawing shows a bolt, B, so fitted that it can slide in ways, and connected wtth the reciprocating nail receptacles by means of a cog taken into a groove made in a piece of metal connected with the nail receptacles. When this bolt is moved it therefore oscillates the receptacles. This bolt has upon it another cog, *q*, which is in gear with a notch on a periphery of a crescent-shaped piece of metal which is mounted on a pivot, the construction being such that when the crescent is vibrated the bolt, and consequently the receptacles, are vibrated.

In close proximity to this crescent-shaped piece of metal there is pivoted an elbow or crank lever. One arm of this lever, *v*, is
38 the handle; the other arm of the lever, *t*, is bored out from end to end, and has located in it a spiral spring which constantly tends to push outwards a wedge-headed bolt, *u*, this bolt always being in contact with the inner or concave periphery of the crescent. This mechanism which I have just described is the mechanism which is described in the patent and referred to in the sixteenth clause of the claim; and I think it may fairly be called an automatic mechanism, because the operator by acting on the handle *v* compresses the coiled spring, and when the proper time has arrived for shifting the ways the coiled spring automatically shifts them. Supposing the parts to be in the position represented in Fig. 12, and that at the same time one of the strips from which the nails are formed is protruding from the end of one of the receptacles and lies between the gripping jaws, and that at that time the operator has made up his mind that a nail of a different length shall be driven at the next stroke of the machine; he then shifts the handle *v* and the bell-crank lever of which it is a part, compressing the spring, but this produces no action in oscillating the ways or receptacles, because there is a strip then lying in the receptacle with its projecting end lying unsevered between the jaws; but as soon as this projecting end is completely severed from the strip, then the bolt *u*, driven forward by the coil spring, oscillates the crescent *p*, and shifts the ways so that a strip to form a different length of nail shall lie between the compressing and sevving jaws.

If the operator move the handle *v* just after a nail has been severed, so that at that time there is no resistance preventing the vibration of the way, then the oscillation of the ways would take place at the same time the handle is moved. It will be seen, thus, that this contrivance oscillates the jaws at the proper time by means of the spring, and prevents the ways or receptacles from being oscillated when there is a strip sticking out from between the jaws, this projecting strip striking against the jaws being the obstacle which prevents movement of the receptacles until that projecting portion of the strip is severed from the remaining portion of the strip. This contrivance also, owing to the interposition of the coil spring, limits the power applied to the arm *v* to the power required to compress the spring, so that there can be no more force applied to shift the receptacles than the force of the compressed spring.

39 In the defendants' machine there are, as I have before

stated, ways or receptacles for formed nails, and not for strips, which are capable of being oscillated in directions perpendicular to their length, or nearly so. These receptacles have attached to them and underneath them a casting which is connected with a rock-shaft lever having two arms (which is, in fact, a bell-crank lever), in such manner that when the rock shaft is oscillated the ways will be moved or vibrated, as before stated. This casting has a hole in its bottom, and a bolt or pin is projected into and drawn out of this hole by the operation of the machine, being drawn out of the hole when the other parts of the machine are in such position as to permit the nailways or nail receptacles to be oscillated with safety. The arm of this rock shaft, corresponding with the piece *v*, instead of being operated in both directions by hand, as in the Goddu patent, is moved in one direction by a spring and in the other by a treadle, the treadle and connecting rod not being in place in Exhibit Defendants' Machine. Now, the thing which prevents sideways oscillation of the receptacles for the strips in the Goddu machine is the end of the strip which projects out from the end of the ways and between the jaws, and this strip must be severed or cut in two before the jaws can be operated by the mechanism of the sixteenth claim.

In the defendants' machine there are no strips, but separate nails; and it would not be possible to make one of these nails to serve as an obstacle to prevent the motion of the nailways. The bolt or pin in the defendants' machine is the obstacle which prevents the motion of the nailways, and this bolt is not cut in two in order to permit the ways to move, as is the strip in the Goddu machine; but, on the contrary, the bolt is drawn out of its socket so that the ways may move. Now, I understand that the jaws and the strip projecting between the jaws are elements of the combination referred to in the sixteenth claim of the Goddu patent because if these jaws and this projecting end of the strip were not present, the automatic shifting apparatus would not be automatic, but the strip receptacles could be shifted at the time when the operator moved the handle *v*, in which case there would be no use for the coil spring and the V-shaped headed bolt.

HENRY B. RENWICK.

Attest: WILLIAM A. COPELAND,
Special Examiner.

40 *Evidence for Complainants in Reply. Taken Pursuant to the Sixty-Seventh Rule of the Supreme Court of the United States, in Equity, as Amended, before me, Henry C. Merwin, Special Examiner.*

BOSTON, *March* 28, 1882.

Present: Elias Merwin, Esq., of counsel for complainants; J. E. Maynadier, Esq., of counsel for defendants.

Deposition of John C. Hoadley.

Direct examination by ELIAS MERWIN, Esq., of counsel for complainants:

Int. 1. Please state your name. Have you already testified in this case?

Ans. John C. Hoadley. I have.

Int. Have you read Mr. H. B. Renwick's testimony given for the defendants in this case, and do you understand the same?

Ans. I have read it, and I understand it.

Int. 3. Referring to that part of Int. 5 and of Mr. Renwick's answer in said testimony which relate to the McKay and Fairfield patent reissue No. 7014, state whether you used the language or expressed the opinion attributed to you in the question, and whether the answer thereto contained in said answer as to your testimony in reference to the defendants' machine, as compared with said reissue No. 7014, is correct.

Ans. The language of the question is not found in my deposition, and in the connection in which it is used in the question and in Mr. Renwick's answer it conveys an idea which I did not intend to express, and it fails to express my idea.

Int. 4. Mr. Renwick, in that portion of his said answer which relates to the said reissue No. 7014, made certain statements with relation to specific parts of the complainants' machine, as de-
41 scribed in their said patent and of the defendants' machine; state whether, in your opinion, said statements are correct, and, if correct in themselves, whether they would show that the complainants' machine and the defendants' machine are substantially different with reference to the inventions you have said are set forth in said reissued patent No. 7014, particularly in the first four claims of said patent.

Ans. That portion of Mr. Renwick's said answer referred to in the question is incomplete and incorrect; and, even if all the statements therein were correct, so far as they go, they fail to show the defendants' machine and the machine described in complainants' patent reissue No. 7014 are substantially different with reference to the inventions set forth in said patent, and particularly in the first four claims thereof; and when the inaccuracies are corrected and the omissions supplied the truth of this statement is still more apparent.

Int. 5. Please give your reasons in full for the two preceding answers.

Ans. The language of the first clause of Int. 5 of Mr. Renwick's deposition does not accurately convey the meaning of my testimony, and the idea conveyed by that language, as construed in Mr. Renwick's fifth answer, is not found in my testimony.

My opinion on the subject referred to in the question was summed up by me at the close of my answer five in the following language (page 18 of record): "I am therefore of opinion that the selecting and carrying mechanism in the defendants' machine is substantially like that described in complainants' patent and a full mechanical equivalent therefor."

In my answer to cross-int. 15 I stated (page 26 of record, lines 3 and 4) "I was considering the relative and not the absolute motion." In my answer to cross-int. 16 I said (page 26 of record) that "nail-

ways" was a perfectly appropriate term" for the troughs in the defendants' machine, but that I had called them "carriers," "because their function was that of carrier and nothing else;" and for this reason I had likened them to the reciprocating cylinder which in the complainants' patent is called the "box or carrier." The words "nothing else," above quoted, require explanation. Un-
42 doubtedly the troughs do perform a function different from the function of the complainants' "box or carrier," in addition to that specific function which both certainly do perform, but that different and additional function is carrying also, being the same function that is performed by the complainants' nail receptacle *v*, in addition to receiving assorted nails of different length and keeping each separate length by itself, namely, the function of transferring nails from a remote point, where the attendant puts them into a machine, to the point of selection—that is, where the machine performs the work of selection.

The words "nothing else," therefore, mean nothing else but carriers—nothing incongruous, nothing conflicting with their function as carriers, since conveying nails lengthwise is, in a certain true sense, carrying them, although certainly not in the same sense as carrying them sideways. But the function I had in view is that which is more particularly connected with and required by the novelty set forth in the complainants' patent.

I adhere to this view, and think that I shall be able to make it perfectly plain by a consideration of the novel and peculiar manipulation required to be performed upon the nail by each machine. On previously known machines an attendant placed in a receptacle nails which were ultimately to be driven. By suitable devices these nails were caused to travel to a tube under which the shoe was placed, and then a driver descending on the nail forced it into the shoe, the tube, or "tube foot" (as it was sometimes called), guiding the nail while driving. To this old process the complainants added another operation, to wit, that of selecting from two or more nails that one which the operator desired to drive.

I may conveniently divide the work to be done by the complainants' machine into three parts.

1. The attendant having put sets of nails of different lengths, each set into its own appropriate receptacle, all the nails then travel, each length by itself, to the place where the operation of selection is to be performed.
2. The operation of selection is then and there performed.
3. The selected nail and no other then completes its journey to the position of the driving mechanism.

43 The essential novelty of the complainants' invention pertains chiefly to the second operation. It is obvious that in previous machines the nails had been made to undergo what I may call local transportation from the part of the machine where the attendant placed them to that other part of the machine where alone they could be driven, namely, to a position vertically under the driver which must drive them and vertically over the nail tube through which they must be driven. But in the old machines the

devices which produced this motion had in view one object and one only, namely, such local transportation. This work is also necessarily performed in the complainants' machine as in all others; but by reason of the novel operation of selection it was made necessary to alter even those devices which perform the old work of local transportation, so as to permit the new and essential operation of selection to be performed and to take part in said operation.

In the complainants' machine there are two or more nail receptacles.

In one the attendant places long nails, all of one size and length (for simplicity, I consider the case where there are only two receptacles), and in the other he places shorter nails all of one size and length. Each set of nails then travels along its own slideway to the place for selection, and each set has its own proper slideway, in order that all the nails of one length shall be in one holder and all the nails of another length in another holder.

The operation of selection performed by the machine does not consist in selecting a nail of desired length from a holder which contains nails of different lengths mixed together, but in determining whether the nails shall be taken from one holder containing nails of one length or from another holder containing nails of another length. The devices which receive each nail from the hand of the attendant, cause or permit each nail to slide down to the place of selection unmixed with the others, and hold it unmixed with the others, ready for selection, are that part of the complainants' machine called, in their patent, "a series of vertical nail receptacles, *v*." It is obvious that the presence of two receptacles and ways, or troughs, or holders (or by whatever name they may be called) is characteristic of and required by the invention in question.

44 Their presence and their use is therefore one of the indices for determining whether this invention is present.

The third part of the operation consists in transferring the selected nail, after it has been selected, from the place of selection to the place of driving.

This is performed in the complainants' device by the "box or carrier *t*."

I now come to point out the necessary steps in the operation of selection.

We have seen that the original distribution, made by the attendant, of sets of nails of each length, each set in its own proper receptacle, is preserved until the nails reach the place where the machine does the work of selection. We there find a series (a series of two in the case we are considering) of troughs, or nailways, or holders, in each of which nails of a particular length hang by their heads (in the particular case under consideration), each foremost nail being equally ready to be taken when selected. On the other side of the operation is a transferrer. It consists of a block of metal with a groove or recess in it, suitable to receive a nail, and has a reciprocating motion, by which it passes at frequent intervals from the troughs to the driver. Any nail pushed into that recess will be

transported to the driver, and will be driven, and no nail can be driven unless it is first pushed into that recess to be so transferred.

We now want to put the right nail—the desired nail—into that recess. We have a series of troughs, *i. e.*, two troughs, each with nails of its own proper length, and the foremost nail of each trough is normally kept in place by a sliding abutment, formed in the complainants' machine by the outer ring or sleeve f^2, which keeps it from moving forward; but each nail is pressed against from behind, and is ready to be pushed out, and will be absolutely pushed out by a suitable picker, if and wherever, instead of that closing abutment, the nail-receiving recess is opposite to the end of the trough and open. The block which is provided with the nail-receiving recess and the lower or delivery ends of the troughs are so arranged with reference to each other that a relative motion of a to-and-fro or reciprocating character may be caused to take place between them.

Whenever, in the course of this motion, this recess and a particular trough come opposite each other (and the recess is opened by bringing the slot q^2 in the shield or thin ring f^2 just over the recess h^2) the foremost nail in that trough will be forced into the recess and that particular nail will be then transferred to the driver. The selection, therefore, is performed in this way: there are several (two or more) troughs, each containing its own special length of nails, ready to be pushed into a recess whenever the nail in the trough and the open recess come opposite each other. The recess is in the nail-transferring block, which carries to the driver any nail placed in it. The recessed block and the troughs have a relative, reciprocating motion and a definite point of arrest for each trough, and the selection is performed by causing such motion to continue until the recess and the desired trough coincide, and arresting such motion when they do coincide. In the complainants' machine the troughs are immovable, and all the motion is performed by the recessed block; that is to say, it performs both a selecting motion and a subsequent transferring motion. The foregoing statement gives in detail the operation of the novel invention in complainants' device by which it accomplishes the new and useful results mentioned in my previous description.

It is obvious also that the foregoing statement describes that operation of selection which takes place in the defendants' machine by which the operator is enabled, in and by means of that machine, to feed to the driver a long nail and a short one, at pleasure; thus the attendant puts all the long nails into one hopper and all the short nails into the other hopper. Each set of nails is transported, unmixed with the others, along its own roadway or trough (one trough being provided for each length) until it arrives at the place of selection, and is held there, separate from nails of different length, ready for selection.

The defendants' machine has now performed upon the nail all the work which in the complainants' machine is done by the parts styled in their patent "a series of vertical nail receptacles, *v*."

Opposite to the end of the troughs is a recessed block, to which a

reciprocating motion to and fro is given by suitable mechan-
46 ism, moving the recess from a fixed position opposite the troughs to the position of the driver, by which motion any nail placed in the recess from any trough is conveyed to the driver. In addition to this transporting motion a selecting motion of an intermittent and occasional and reciprocating character takes place between the ends of the trough and the recess, and by causing this motion to take place at the right time and to be arrested at the right time the recess can be caused to coincide with the end of either trough at pleasure. When it so coincides with the end of any one trough the foremost nail in that trough is pushed into the recess, and the operation of selection is completed. It is actually performed by the relative motion of these two parts, a motion which is so regulated that at the proper time the recess in the transferring block and the trough containing the desired nail shall coincide.

It is true that their selecting motion in the defendants' machine is not performed by the transferring block, but by the gang of troughs, all of which are fastened together as one block, and in the complainants' machine is performed by the transferring block itself; but the essence of the selecting operation consists of a relative motion between the two, and of the arrest of this motion when the two have arrived at the desired relative condition. It is, therefore, not material which receives the absolute motion (absolute with reference to the frame of the machine), and the giving of the absolute motion to the one rather than the other does not change the essential character of this novel operation nor the nature of the novel result produced.

Now, it was not with reference to all the work, new and old, performed by each one of the different parts of the machine, but with reference to this, which is at once the most important and the most distinctive novelty introduced by the complainants, that I perceived that the selecting motion was performed in the complainants' machine by what the patent calls the "box or carrier *t*" and in the defendants' machine by the gang of troughs.

I, therefore, noted, and I think with perfect accuracy, their equivalence, as regards this special and most important and distinctive function of selection.

There are in each machine three pieces of work to be done
47 upon the nail between the receptacle, where the attendant delivers it to the machine, and the place where it is to be driven.

1. The transfer of the nail unmixed with nails of any other length from the place where the attendant puts it to the place of selection.

2. The selection.

3. The transfer of the selected nail from the place of selection to the place of driving.

In each machine there are two parts to perform this operation, to wit:

1. The ways in troughs taken collectively; and

2. The recessed block; for, in the defendants' machine, I regard

the hoppers as a funnel-shaped and trough-shaped adjunct to and enlargement of the upper end of the nailways, so far as receiving the nails from the hand of the attendant is concerned.

In each machine the trough performs the first part, and a reciprocating block performs the third part; and, in so far as these particular parts of the work are concerned, these parts of the two machines are the equivalent of each other.

The work of selection is not performed by any one part alone, but by the combination and co-operation of the troughs and the reciprocating block. It is actually performed by that relative motion between them (which I have called the selecting motion), which is the most distinctive part of the invention set forth in the complainants' patent. As regards this characteristic feature, the reciprocating or laterally adjustable gang of troughs of the defendants' machine performs the motion which is performed in the complainants' machine by the reciprocating block.

Perhaps the simplest way of stating the same thing is that the leading feature, the very essence of the most important invention set forth in the complainants' patent, is the combination of the gang of troughs and the recessed block having the relative selecting motion which I have described, and that combination is found in both machines.

The essential character of this combination is not substantially changed by causing and controlling the relative motion by means of an absolute motion of a particular character given to one
48 of these parts instead of an absolute motion of the same particular character given to the other part.

Mr. Renwick's description of the hoppers and nailways of the defendants' machine agrees substantially with mine (with certain noticeable exceptions), as I have ascertained by writing both out entire in parallel columns, and carefully comparing them, except that Mr. Renwick explains at needless length the tossing up of the nails inside of the hopper (it is "tossing up" and "falling down," not "lifting up" and "sliding off" at working speed, as I found by witnessing the operation with the hand hole open), that they may fall into the true receptacles which are the exact equivalents of the "nail receptacles adapted to receive and support separate nails of different lengths," described in claim 1 of the complainants' patent. Mr. Renwick himself, perhaps inadvertently, finds there exact equivalents of the receptacles of the McKay patent in the hopper of the defendants' machine. On page 35 of the record, line 16, he says: "This hopper is provided additionally with two nailways, or receptacles as they are called in the McKay patent, one for each division of the hopper. These nailways project in a direction inclined downward towards the head of the machine. * * * On top of that part of both of the ways which is within the hopper, and attached to the ways, there is a trough without ends and with sides inclined upwards and outwards. As nails are dropped by the shelves they fall into these troughs, and the form of the trough causes the nails to arrange themselves parallel with the length of the trough. When so parallel, or nearly so, the bodies of the nails

drop between the two parts of each way, and their heads are caught by and rest upon the tops of the ways." All this is justly descriptive of that part of the defendants' machine which I have called a "receptacle," and have stated, as I believed correctly, to be, so far as concerns the mere function of receiving from the hand of an attendant nails of different lengths, and keeping the different lengths separate, the exact equivalent of the "nail receptacles adapted to receive and support separate nails of different lengths" of claim 1 of the complainants' patent. As to the additional preparatory work of aligning nails by a process of which Mr. Renwick truly says (page 36 of record, line 13), "* * * substantially
49 such a hopper, with vibrating shelves and ways leading out of it, provided with a trough, is old in screw machinery."

This fact, that it is old and open to adoption by the complainants on the same terms as by the defendants, is sufficient reason why I admitted all but the most general consideration of that preparatory work of alignment done by the hoppers (page 15 of record, line 56), and confined my comparison of the defendants' machine and complainants' device to that feature of the hoppers in which they are the exact equivalent as receptacles of the complainants' device.

Int. 6. Mr. Renwick, in his answer to Int. 4 (pages 32, 33, 34 of record), expresses at the close of his said answer (page 34) the opinion: "For these reasons I believe that the machine described in the patent and the reissue would not work practically to drive nails as described without alterations and additions." Please give your opinion on that point, with your reason therefor.

Ans. I see nothing in Mr. Renwick's alleged reasons which causes me to doubt the successful working of a machine made, with the ordinary skill called for by the state of the art, strictly according to the descriptions, specifications, and drawings of said patent without invention. "The first difficulty" which Mr. Renwick sees — that "the carrier grooves, marked h^2 in Fig. 4 of the patent, do not transport a nail from the nail receptacle to the place where it is to be driven, * * * because," as he says, he "can find no provision whatever in the patent to prevent this nail, after it has been received into the verticle groove h^2, from dropping out of said groove before the groove jets over the tube f^2 and under the hammer." (Last five lines of page 32 and first six lines of page 33 of record.)

To this I reply that there was no need of putting into the patent anything on that subject, since nails will not fall through the hole unless the recess is made too large, and this is too obvious to require mention. The very character of the cylindrical cover is such that with a recess of proper depth it perfectly and fully supports the nails while in the recess by the slight pressure caused by the elasticity of the cover.

Mr. Renwick's second objection is equally groundless.
50 Almost an entire page (page 33, line 9 to bottom, and page 34, line 1), too long to quote, and too intricate to be much condensed, is devoted to headless nails of certain suppositious form; "* * * whether pointed or with ends perpendicular to their length," is his language. The context shows that by "pointed"

nails conical or uniformly tapered nails are meant; and by nails "with ends perpendicular to their lengths" seem to be meant wedge-shaped nails—*i. e.*, nails with two opposite sides parallel, and the other two sides converging from head to point. But nothing is said of such nails as a mechanic skilled in the art would use in such a machine—that is, nails with cylindrical or prismatic bodies and tapering points; such nails pushed forward in the ways by any of the well-known devices, such as rubber or spiral wire springs, would have their axis maintained in a parallel position by the contact of the parallel sides of their bodies, and so this objection vanishes.

As to headed nails (page 34, lines 1–16 of record) Mr. Renwick's objections do not seem formidable, in view of the fact that well-known devices successfully used in screw machinery are open to the complainants.

In a word, I can see nothing in any or all of the objections to give any concern to any designer who understood the state of the art, who had the skill to apply his knowledge, and who made friendly use of his knowledge and skill.

The above are all Mr. Renwick's recorded reasons, so far as I can discover, for doubting the success of a machine made according to the complainants' patent, save an incidental reference to "the spring *i*," which, he confesses, he does not understand. Here again the state of the art removes all the supposed difficulty by offering us a well-known form for the "suitable spring or finger *i*" (patent, page 2, line 8 from bottom), which should enable it to enter "between the nail next to the nail carrier and the one next back of it," and, as it passes them, press each one towards the nail carrier. No claim is made for invention in connection with this "spring or finger *i*," and the reference to it is sufficient to point out clearly a well-known device.

For these reasons I do not concur with Mr. Renwick, but fully believe, on the contrary, that his objections are unreal and imaginary, or such as have been already subdued by previous inventors. This opinion, which I base on my knowledge of the subject, is confirmed—is, indeed, converted from an opinion to a fact within my knowledge—by experiments with certain models which I have examined and found to be faithful representations and embodiments of such features of the complainants' patent as are touched by Mr. Renwick's objections. The operation of these models is strictly according to the mode described in the patent, and gives no indication of the faults and imperfections which seem to have been found so formidable by Mr. Renwick.

51

(Adjourned.)

MARCH 29, 1882.

Int. 7. Turning to Mr. Renwick's testimony in reference to the sixteenth claim of the Goddu patent, No. 163,474, and the defendants' machine as compared therewith, please state whether you agree with or differ from him in the opinion and reasons given by him on that subject, with your reasons.

Ans. I believe Mr. Renwick's description of the Goddu machines,

particularly of all that relates to the sixteenth claim of Goddu's patent, occupying the last paragraph of page 36 and all of pages 37, 38, 39 of record, does not differ substantially from my very brief description of the same mechanism in my answer to Int. 8, pages 20, 21, and my more full description in answer to cross-int. 20, pages 27, 28.

Of the essential train of mechanism I say (page 28): "While the indication of a change is given by hand, the change itself is said to be automatic.

"It is set at any time, to move at the proper time, and when the proper time comes it moves." Mr. Renwick says (page 38, line 9): "I think it may fairly be called an automatic mechanism, because the operator, by acting in the handle *v*, compresses the coil spring, and when the proper time has arrived for shifting the ways the coiled spring automatically shifts them." Differences there are, of course. These differences grow out of the fact that in the Goddu machine the nail strips may be, and in fact are, made to serve as the stops; while in the defendants' machine the separate nails will not answer for this purpose, and on that account a special stop
52 has to be introduced. But the necessity of some stop is the same in both. This necessity arises from the same cause in both, namely, the occasional shifting from nails of one length to nails of another length; the point of time when the locking must not be undone, namely, while introducing and driving a nail, is the same in both. The bolt of the defendants' machine is the equivalent for that purpose of the nail strip of the Goddu machine, and the combinations are equivalent.

I have pointed out these differences; Mr. Renwick expatiates on them. He considers the differences to be essential and material; I regard them as formal and immaterial. He denies the equivalence; I insist on it. I therefore agree with Mr. Renwick, substantially, as to his facts in relation to the Goddu patent, claim 16, and the defendants' machine, but differ from him as to his conclusion, and see no reason to change my opinion.

Int. 8. You have referred in your answer to Int. 5 to the "transfer block" in the defendants' machine. Have you a drawing of it? If so, please produce it, and describe it particularly, and its function in the machine.

Ans. I produce it, and insert it in my answer.

Fig. 1 is a top view of the tube foot, as it is sometimes called, the "recessed block" of my deposition, relating to the block detached from the lever which supports it in the machine, together with a top view of the picker and a top view of a portion of the lower end of the nearly parallel nailways.

In each of the latter above the picker I have represented five circular nail heads, by which nails are represented to be supported in the grooves shown by parallel lines. The nailway, marked "G," is represented as set in proper position for delivering nails to the recess which is in the same line, but on the other side of the picker. The recess and nail tube are represented as empty, as though a nail had just been driven; but the picker is represented as at a very slight distance

from the surface of the block, each side of the recess about as it would be—about as it would be if there were a nail head in the recess. It is so shown merely for clearness of representation. The foremost nail of the nailway marked "H" rests against the picker, and would
53 continue to rest against it if the picker were withdrawn to the left hand sufficiently to uncover the nailway marked "G" and to permit the foremost nail of that row to move forward toward the recess and to be picked off by the return motion of the picker and forced into the recess. Fig. 2 is a side view of the same recessed block, showing the side toward the nailways, for which purpose it is represented as turned downward with its upper end toward the bottom of the page. Fig. 3 shows the picker turned downward in the same manner and also removed a little way from the recessed block to avoid confusion of lines. Fig. 4 is a vertical section on the line A B of Fig. 2 and B C, Fig. 3, but representing the picker on the line B C as in about its proper position to the recessed block. The nail tube is shown in Fig. 4 to be a continuation of the recess, and the same fact is indicated by dotted lines in Fig. 2. The position of the picker in Fig. 1 with relation to the recessed block is probably not quite correct, as the edge is probably placed a little too far to the right hand. In fact, it is so placed when at its extreme position that when moved to uncover the recess to admit a nail it does not remove the support of the nails in the other nailway. On the other hand, when, by the motion which I have called a carrying motion, the conjoined nailways are moved to the right so as to enable nails to be selected from the nailway H, the point of the picker, at the extremity of its motion to the right, falls short of the nails in the nailway G in their new position, and the foremost nail in this row in such circumstances rests upon the smooth surface of the recessed block.

The function of this apparatus has been described at full length in my previous answer.

Int. 9. You have referred, in your answer to Int. 6, to two models. Please state whether those models are now present and identify them.

Ans. They are present, and to one is annexed a tag marked "U. S. C. C., District of Mass. McKay *et al. v.* Stowe *et al.* Complainants' Model No. 1. H. C. Merwin, Spl. Ex." And to the other is annexed a tag marked "U. S. C. C., District of Mass. McKay *et al. v.* Stowe *et al.* Complainants' Model No. 2. H. C. Merwin, Spl. Ex."

54 Cross-examination by J. E. MAYNADIER, Esq., of counsel for defendants:

Cross-int. 10. Do you recollect when it was that you examined the nailing machine referred to in your fourth answer, page 13 of the record?

Ans. I do not remember the exact date and I have not with me the memorandum book which I had at that time. I remember that it was but a short time before the date of my deposition of which

the answer referred to forms a part; that it was a pleasant day in early summer, probably early in June, 1880.

Cross-int. 11. You nowhere mention in your first deposition, so far as I can see, the recessed block which you lay such heavy stress upon in this present deposition; can you refer me to any part of your first deposition in which this recessed block is mentioned or in any way alluded to?

Ans. In my answer to Int. 5, page 14, of record, line 13 from bottom, I intended to refer to it and did refer to it with all the distinctness which I thought it called for in the following language: "Suitable mechanism at the proper time separates the foremost nail of those in the nailway set for delivering nails to the nail tube from the one next to it, and passes it into line with the axis of the nail tube and driver." It is included in my invention, and, I think, in my language, in the following language, from the same answer, page 17, last clause: "Further, the mechanism and its operation are substantially the same in both, because in both it consists of a device for causing the carrier to select and convey from the appropriate nail receptacle to the nail tube a nail of length suited to the thickness of stock to be united." I also refer to the same thing in the following language, answer to cross-int. 12, bottom of page 23. I do not mean to be understood that the driver enters the carrier, but that the end of the carrier is brought by the lateral motion into close proximity with the nail tube, when, as I have somewhere said in my deposition, suitable mechanism separates the foremost nail from the one next to it, pushes it into line with the tube and driver. * * *" It is obvious that in this language I mean by "carrier" what I had before described as such, namely, nailways with lateral motion having the function of carrying nails from more than one position to one fixed position in the performance of the work of selection.

Cross-int. 12. I had no doubt, when you gave your former deposition, that the word "carrier" in the matter just quoted by you was intended by you to mean the two nailways in the defendants' machine and the box *t* in the McKay and Fairfield reissue, and that the term nail receptacle in the matter quoted was intended by you to mean the nailways marked *v* in the McKay and Fairfield reissue and the hoppers, so-called in the defendants' machine, which you call, on page 14, "nail receptacles, * * * separated from each other by a vertical partition, in a stationary case, of approximately hemispherical form;" or, in other words, that you did in fact testify, and intended to testify, that the two receptacles into which different lengths of nails are placed by hand in defendants' machine were the equivalents of the receptacles into which the nails are intended to be placed by hand in the McKay and Fairfield reissue, marked "*v*," and that the nailways which, in the defendants' machine, conduct and guide the nails from the vessels in which they are placed by hand were the equivalents of the nail carrier and its adjuncts marked "*t*" in the McKay and Fairfield reissue, and your present deposition has not satisfied me that I am in error as to this; while, on the other hand, a rereading of the greater part of your former deposition has confirmed me in the belief that I am not in error. Please

consider this matter, and state whether, in your own opinion, the meaning to be gathered from your former deposition, as to the equivalence of the so-called hopper in the defendants' machine with the troughs *v* of the reissue and of the two nailways in defendants' machine with the carrier *t*, is not, in substance, the meaning which I say that I got from what you said.

Ans. My meaning is not quite fully expressed in the language of the question.

Turning to that part of my answer to Int. 5, commencing at the bottom of page 14 of record, I say: "There is a mechanism * * * by which the nails are tossed up so as to fall into a trough attached to each nailway, having such inclination towards the front end of the nailways or nail carriers as to cause them to slide along down, their points and all but their heads dropping through a slit
56 through which their heads will not pass, so that they hang suspended by their heads, with their points pendent, passing down in this manner to and into the nail carriers or nailways, in which they hang suspended in the same manner, their motion facilitated by light and rapid blows of hammers, provided for the purpose. They are taken from one or the other of the nail carriers (from whichever one is set in the proper position for delivery), the entire row following down one nail's breadth in that carrier each time one is taken out to be driven, but remaining stationary in the other nail carrier until that is called into action in its turn, when the nails in the first become quiescent until brought back into use."

This process I have illustrated by two or three suppositious cases, likely to arise in the operation of the machine, in which the actions I have described in the above quotation are seen in operation, and are seen to account fully for all those operations of the machine rendered necessary by the use of nails of more than one length and by the resulting necessity of selection.

This language now seems to me so completely to express my idea as the same is unfolded at great length in my answer to Int. 5 of the present examination that I see nothing to explain, to modify, or to retract; but, plain as this is to my mind, I desire to make it equally plain to counsel for the defendants and the court. It will be seen in the above-quoted language that there is within each compartment of the approximately hemispherical case a trough attached to each nailway, having an inclination downward towards the front, such that the nails will slide along down, and each trough having a slit in its bottom, through which the bodies of nails will pass, while their heads will not, in which they hang suspended, and pass along down to the nail carriers and into the nail carriers. It seems too obvious to require comment that I meant then, as I mean now, by the term "nail receptacle" not the case only, but these troughs as well. Turning back to near the top of page 14, to the sentence from which a quotation is embodied in the question, I find my language to be: "These nail receptacles are separated from each other by a vertical partition in a stationary case." It is seen, therefore, that I have
57 not called the stationary case a receptacle, but that there is in

that case a partition, which separates the two receptacles from each other.

It does not divide one receptacle into two receptacles, but it separates the one from the other. An essential part of each receptacle —indeed, the essential part, so far as the function of receiving nails from the hand of the attendant is concerned—is that slit in the bottom of the trough through which pendent nails pass along the receptacle to the carriers. All the rest—the case, the hand-holes, the tossing mechanism, which produces a constant shower of nails, the trough with flaring sides, which always holds its dish right side up in this shower—all this relates to anticipatory and preparatory work, which ends before the invention described in complainants' patent begins, and is, as Mr. Renwick truly says, old in screw machinery. It aids the attendant in putting nails into the machine, but neither makes nor mars anything in the subsequent operations covered by the invention set forth in complainants' patent.

It will be seen that I have distinctly stated that the nails passed down in the slitted receptacles to the nail carriers or nailways, and it will be equally well seen that the whole length of this passage lies along the path of the receptacles, which are, as it still seems to me, clearly the exact equivalent of the nail receptacles of claim, reissue 7014, "adapted to receive and support separate nails of different lengths." As to the nailways, which I have called nail carriers, I have said with equal distinctness that the suspended nails, segregated as to length, each length in its own receptacle, pass down from the receptacle, not only to but into the nail carriers (or nailways), and that, notwithstanding the lateral motion occasionally given to these carriers for the purpose of selection, and without impediment to such lateral motion, but in furtherance of the purpose of such motion, they do pass along down said nailways, "the entire row falling down one nail's breadth in that carrier each time one is taken out to be driven." Although this process is explained at great length, with great iteration and reiteration, in my answer to Int. 5 of this present examination it is not, to my mind, expressed any more clearly there than it is in the quotation with which I began this answer, from my answer to Int. 5 of my
58 original deposition. A new duty in performance of a new function is imposed upon an old and familiar part, namely, the trough or nailway (old singly, but new in combination with other troughs or nailways, in the manner in which they are used in complainants' device and in defendants' machine), and although the old duty in performance of the old function has still to go on all the same, yet the two duties are not in conflict, the two functions are not incongruous, and the new duty is discharged, and the new function performed, just as completely as if the carriers had nothing else to do. They are, therefore, as to that function, which function is the very essence of complainants' invention—the function, namely, of selection—already fully explained, the exact equivalents of the part of complainants' device, called in their patent the box or carrier *t*. To illustrate this: A wheelbarrow might be made with a platform, which should serve as the platform of a weighing scale.

A keg of nails placed on the platform might be weighed thereon and then trundled off on the wheelbarrow for delivery. Now the scale would be no less a scale because it was also part of a wheelbarrow. Perhaps a more pertinent illustration may be given.

Suppose two parallel railway tracks side by side, and that it is desired to take loaded cars sometimes from the one track and sometimes from the other, and to transport them to some fixed points a little distance laterally. Suppose at the delivery end of these railways we have a transverse track, sunk in a pit a little below the level of the others, and that we have a truck fitted to run on this transverse track of width equal to the length of the cars to be transferred, and with rails across it from side to side, just level with the rails of the railways, and of equal gauge therewith. If now we place this truck in line with one of our original railway tracks, and roll a loaded car upon its own wheels along the original track to and upon the coincident track upon our transverse carriage or truck, this rolling motion will exactly represent the longitudinal motion of nails along the troughs or nailways. If we now move the transverse truck with the railway carriage upon it to the new and desired position, and then roll it off in continuance of its journey to its
destination, the longitudinal motion of rolling the carriage
59 on and off the truck in no way conflicts with the function of the truck as a transverse carrier.

If now we suppose the original railways to be of moderate length, and to be supported on transverse ways throughout their whole length, so that the railway tracks with their carriage can be moved laterally to just sufficient extent to bring either one of them at pleasure to some fixed point of disembarkation, the continued forward motion of the carriages upon the transversely moving tracks cannot affect the function of these transversely moving tracks as transverse carriers exactly equivalent to our supposed transverse tracks. Illustrations might be multiplied, but I cannot find in my own mind a shade of difference between my original conception of the equivalence I pointed out in my original deposition and the more full and elaborate development of that conception in my answer to Int. 5 of this present deposition. It is true that what I have called the receptacles in the defendants' machine, equivalent to the receptacles of complainants' patent, do share the positive lateral movements of what I have called the carriers, but, functionally considered, this movement is without significance, and when truly regarded as a relative movement it ceases to be movement at all. The relation between the troughs which are attached to the top of these receptacles and the nails is such that for the proper performance of their function their dish should always be right side up in the shower of nails. This shower of nails is of much greater breadth than any lateral motion of the receptacles, and is about equally dense everywhere.

The troughs are always under the falling nails. No lateral motion which can be given to them can place them in any other relation to the falling nails. Relatively to the mass of falling nails, they do not move—that is to say, the actual motion, positive with

relation to the frame of the machine, is without effect upon their function, and may be considered as really *nil* relatively to the nails. This would be so if the case and all the tossing mechanism were removed. The attendant could just as easily put nails into them, notwithstanding their occasional lateral movement, as he could if they never moved at all, just as he can put them in through the instrumentality of this extraneous device, as well with as without
60 this lateral movement, which the nail receptacles share with the nail carriers; or, if you please, which these parts, as nail receptacles, share with continuous parts, which, as carriers, have to take part in the work of selection. It is not uncommon to find two distinct functions combined in one material thing, as, for instance, a simple piece of metal. The bowl of a spoon, for instance, is a vessel capable of containing a liquid; the handle of the same spoon, although continuous and homogeneous with it, as to material substance, has a distinct and different function. The functions are not incongruous, and they certainly assist each other in the complex operation of conveying soup to the mouth; but the mutual helpfulness in this case is no more marked than that of the function of longitudinal transportation in the nailways, and that of lateral transportation in and by the same railways as nail carriers.

Cross-int. 13. I now attach a new meaning to the first paragraph on page 14 of your former deposition, and understand that you meant then and mean now to say that what I have been accustomed to regard as the upper portions of the nailways, namely, those portions within the stationary case or hopper, are the equivalents of the nail receptacles *v* of the McKay and Fairfield reissue; am I right in this? And, if so, please state, as clearly as the subject admits of, what portions of the entire nailways you consider the equivalents of the receptacles *v*, and what portions of those nailways as the equivalents of the nail carriers *t* of the reissue.

Ans. I don't see any way to make the matter plainer than I have already done, or to state the matter plainly in any other or different way from that which I have already done. Without confining myself narrowly to the definition I might almost say that that part of the two receptacles in the defendants' machine, or that fact with regard to them, which makes them the equivalent of the receptacles *v* of complainants' patent is that they consist of more than one, and that, being two in number, they are capable of sustaining separate nails of different lengths with reference to the selection of nails of one or the other length at pleasure by the machine through combination with other appropriate devices, elsewhere fully explained, to the driver for driving.

To answer the question more definitely, as I feel bound to do,
61 I should say that in the actual construction of dendants' machine that part of the slitted ways which lies within the case is more strictly the equivalent of complainants' receptacles *v*, considered as receptacles; but if they were sawed off just outside of the case it would still be possible to put separate nails of different lengths from the hand of an attendant into them, and they would still be the equivalent of the corresponding parts of complainants' device;

equivalent, I mean, in ultimate effect, though not in convenience of operation, just as a spoon with the handle broken off might be managed by the shank effectively, if not conveniently.

It must be obvious that the name "receptacles," lettered v in complainants' patent, is applied to parts which have a complex function—in fact, two functions—namely, that of receiving nails from the hand of an attendant, and guiding them and conveying them downward or forward to the point of selection; but the great fact in connection with them is that there are more than one, and that each one can do its part of the work for nails of a particular length. But, except in so far as they contribute to the relative motion between themselves and the recess in the box or carrier t, they do not take any part in the work of selection after the nails are brought to that point. Being an element in such relative motion, they do to that extent take part in the act of selection.

Turning now to the nailways of the defendants' machine, if what I have called the receptacles proper were cut off and taken away, we should still have a broken but serviceable spoon, which would still be equivalent to the nail receptacles v as receptacles, and to the carriers t as carriers, which could take nails from the hand of an attendant, convey them longitudinally to the point of selection, take part in the work of section by forming an element in the relative motion between the nailway and the recessed carrier, exactly equivalent to corresponding parts and devices of complainants' patent, notwithstanding that in bringing about this relative motion that part which was passive before now becomes active—on which account I have called it a nail carrier.

Cross-int. 14. I infer that you intended to answer the first part of my preceding question in the affirmative, but for greater certainty I will ask you to answer that part of it now.

62 Ans. Yes; in the actual construction of the defendants' machine, you are right.

Adjourned.

APRIL 14, 1882.

Cross-int. 15. Will you please explain briefly how the spring marked "i^2" operates in the two cases mentioned in the reissue?

Ans. This spring i^2 is fastened to the inner portion of the compound carrier t, to that portion in which is the recess h^2. It is so fastened actually, though somewhat indirectly, by attachment to the shaft u, through a flange, x^2, secured to said shaft, on which said inner block is also fastened. The point of this spring is of a form well known in such mechanism, thin, wedge-shaped, and is so set that in its normal position it is just a nail's diameter from the outer surface of the outer case; it is so shaped for a little distance from the end, say half an inch, more or less, that the side next to the cylinder comes in contact with the cylinder, and rests lightly against it when the thin, wedge-shaped point is in the normal position I have described.

From this point it slants away again in the opposite direction much in the same manner. This form may be obtained by bending

the spring to the necessary extent, so that the side of the spring towards the carrier t resembles in form the face of two wedges, placed with their heads or their thick ends together; but these faces, slightly concave towards the carrier t, and a little rounded off from one to the other at their point of junction, which is the most prominent point of the spring, towards the carrier t, and is the point which I have said above comes in contact with the cylinder (or carrier t), and rests lightly against it when the thin, wedge-shaped point is in its normal position, one nail's diameter from the outer surface of the cylinder or carrier t. The spring must be so moved that this most prominet part is in the same radial line as the recess in the inner recessed block of the carrier t—*i. e.*, it must be just opposite said recess at the time when a selected nail is to be put into the recess to be carried to the driver and driven. The mode of communicating motion to the spring i^2 is most clearly shown in Fig. 2. The flange x^2 has an arm extending out radially (to the right hand in Fig. 2), in which is inserted (or to which is secured) a rod extending downwards to support the fixed ends of the spring i^2. The flange
63 x^2, its radial arm extending to the right hand, the rod extending downward from the radial arm, and the fixed end of the spring i^2, constitute a system, the parts of which always have a fixed position *inter se*, and move (when they do move) all together. Motion is given to this system (and consequently to the spring i^2 forming at its — a part of said system) by means of the pin u^2, which is part in the flange x^2 and the slot v^2 in an enlargement of the shaft u, just above the flange x^2. This slot v^2 allows a limited freedom of motion to the shaft u (of course including its enlargement, in which is the slot v^2) before it will impart motion through the pin u^2 to the flange x^2 and to the system of connected parts. Upon every reversal of the motion of the shaft u, motion to the extent of the length of the slot v^2, less the diameter of the pin u^2, may take place before the end of the slot v^2 will come into contact with the pin u^2 and compel it to move, and with it the flange x^2, its radial arm, the upright spring supporter, and the spring i^2, and the friction pad w^2, pressed by its spring against the flange x^2, will hold said flange x^2 and its system from moving, except when motion is compelled by the slot v^2 and the pin u^2. Whenever the recess in the inner block of the carrier t^2 is moved by its shaft u from the position of the driver (or from a position near the position of the driver) towards the lower ends of the nail receptacles v, for the purpose of taking a selected nail from a receptacle, the first part of the motion (being in reversal of the last previous motion) leaves the flange x^2 and its system, including the spring i^2, quiescent under the control of the friction pad w^2; but as soon as the end of the slot v^2 comes in contact with the pin u^2 equal angular motion is communicated to the flange x^2, its arm, the upright spring supporter, and the spring i^2, through its fixed end.

At this time, and at all such times, the most prominent part of the spring i^2 is directly over, or opposite to, or radially in line with, the recess, and retains such position until after motion has taken place in the reverse direction, of sufficient extent to overcome the

length of the slot v^2 less the diameter of the pin u^2; but no such reversal of motion can take place until after the transfer of a nail to the recess. Determination as to the particular nail to be taken is exercised through the steps k^2, acting in connection with the shaft u and the stop m^2, the operation of which appears to me to be too plain to require further comment. It remains to explain the mechanism by which the recess h^2 is kept covered by the thin cylinder of the carrier t while passing in front of any unselected nail, and opened at the proper time to admit a selected nail. A short horizontal slot with a pin in it about in the middle of the length of the slot is to be seen in Fig. 6, marked "t^2." The slot t^2 is in the thin outer cylinder, and is a little more than three times as long as the width of the recess—that is to say, there is a space between the pin and each end of the slot a very little greater than the width of the slot h^2, which recess is equal to the width of the slit g^2.

The pin t^2 is fast in the inner recessed block, and is so set in relation to the slot t^2 that the slit g^2 is directly over the recess h^2 when the pin t^2 is in the middle of the slot t^2. It of course follows that when the pin t^2 is at either end of the slot t^2 the recess is covered and closed by the parts of the thin cylinder t, one side or the other of the slit g^2. The thin outer cylinder receives motion (in part) from the inner recessed block, through the pin and slot t^2, and of course lags behind at each reversal of motion, to the extent of the excess of the length of the slot t^2 over the diameter of the pin t^2, and it is held stationary except when compelled to move by said pin and slot t^2 by a friction pad pressed by a spring, all very clearly shown in Figs. 1, 2, 3, 4 and 5, but not lettered or referred to in the specification except in the language (page 2, last two lines of column 1, and upper four lines of column 2, of official copy of patent), "* * * suitable devices holding the parts in relative position for the action of the mechanism in receiving the nail and in transferring it to a position where it is received and to position when the nail is driven." Notwithstanding the omission of more definite reference, this friction pad is most clearly shown, and its function is so plainly indicated by the clear description of the operation of the slot and pin t^2 that no one at all familiar with mechanism of this character could be in doubt as to this nameless but fully developed friction pad, which I shall hereafter call, when I have occasion to refer to it, simply the friction pad, to distinguish it from the other pad, which is lettered w^2. When, in moving from the position of the driver towards the lower end of the nail receptacles v, to take a selected nail, the pin t^2 comes to the end of the slot t^2, in the thin outer cylinder of the carrier t, which cylinder is held up to that time quiescent by the friction pad, the pin and slot t^2 overcome the friction of the friction pad and compel the thin cylinder to turn along with the recessed block with the recess closed. Arrived at a point where one of the steps k^2 strikes against the stop m^2, and arrests the recess exactly opposite the selected nail, but with the recess still closed, the sliding piece o^2 comes into action, and, by means of a wedge-shaped end acting on one of the notches in the flange of the thin outer cylinder, moves said cylinder forward

so as to bring the slit g^2 just opposite the recess h^2, when, of course, the recess is open.

But we have seen that whenever the recess was so placed directly opposite the selected nail the most prominent part of the spring i^2 must also be opposite the recess. The form of this spring i^2 causes it to enter between the foremost nail and the nail next to the foremost, and to be strained by having its most prominent part pressed off one nail's diameter from its normal position against the outer surface of the thin cylinder. It is, therefore, always ready to push this foremost selected nail forward into the recess as soon as the recess is uncovered, and, the recess being uncovered by the action of the sliding piece o^2, the nail is pushed in by the spring i^2 and is held by it from falling until the thin outer cylinder (held from turning by the friction pad while the pin t^2 is overcoming the lost motion in the slot t^2) takes the place of the spring i^2 in holding up the nail, and the nail is carried by the return motion of the recessed block to the driver to be driven.

I am aware of the prolixity and apparent intricacy of this description, but do not see that I can shorten or simplify it without sacrifice of accuracy.

Cross-int. 16. Can you see any need of the friction pad w^2 and the pin u^2, slot v^2; that is, wouldn't it be just as well to connect the spring i^2 directly to the flange in which the slot v^2 is formed.

Ans. I have not discovered any use, and think that a perfect mechanical equivalent would be found in the fastening suggested in the question.

Cross-int. 17. Without the thin cylinder and its slit g^2, and its slot and pin t^2, and the wedged-shaped piece and teeth, both
66 marked n^2, and the spring i^2, and suitable actuating mechanism for each part, it would be impossible for the compound carrier to take a nail from the receptacle v, would it not? If so, will you point out what you think are the equivalents in defendants' machine of the parts mentioned as parts of the compound carrier?

Ans. Without the parts enumerated in the question, or their equivalents, it would be impossible for the machine as organized to perform the function inquired about in the question. As to the mechanical equivalents of said parts to be found in the defendants' machine, I think they are to be found in the devices by which the parts, which are called nailways in defendants' patent, and which I have called nail carriers, are made to transport nails laterally, so as to bring about a proper relative position of a selected nail, and suitable mechanism for transferring it to the position of the driver. This device consists of moving said nailways or nail carriers laterally with the nails in them, so that the carrier which has in it nails of the length selected shall be at the right time for selection at the fixed point of delivery, whence selected nails are transferred to the driver. If desired I can describe the whole mechanism, but that would include in its functions the functions of the steps k^2, the stop m^2, the sliding piece o^2. Perhaps this is desired; if so, I will describe it.

Cross-int. 18. Is it your opinion that every nailing machine

having a nail tube and a driver and more than one nail receptacle adapted to receive and support separate nails of different lengths is substantially the same as the machine described in the McKay and Fairfield reissue, and referred to in the first clause of the claim, no matter how great the difference may be, so far as concerns the parts for taking a nail from the proper receptacle and for getting in into the nail tube so that the driver may drive it?

Ans. I think the question is so hypothetical I must decline to answer it. I do not know what devices might be made to perform this highly complex function or set of functions, but of any machine having parts as plainly equivalent as defendants' machine has I should say it would be substantially the same as the devices set forth in complainants' patent. I am, of course, aware that there may be improved methods of performing some of these functions or some of the steps of this complex function, which, as improvements, subject to the prior invention of complainants, might be good ground for valid patents, but I do not see that any such improvements, if such there be in defendants' machine, would be relieved from their subjection to the prior invention of complainants.

67

Cross-int. 19. And do you think that the fact that certain mechanism performed this complex function of taking one nail from that one of the receptacles which held that length of nails and got it in proper relation to the nail tube and driver would show that it was the substantial equivalent of the mechanism for performing this complex function described in the complainants' reissued patent?

Ans. The subject-matter of the question covers the very essence of the complainants' invention. They devised a method of doing this very thing. As parts of the mechanism of their invention there were receptacles for containing assorted nails, devices for carrying out the function of selection, and for insuring the transportation of a selected nail and none other to the place of driving. I am unable now to think of any mode by which this essential feature of their invention could be embodied in mechanism without mechanical equivalents for the essential parts of their machine which I have mentioned.

The defendants, in their device for performing this same essential function, have certainly made use of the separate nail receptacles for sustaining by their heads nails of separate lengths and of mechanical devices for performing the action of selection and for carrying the selected nail to a point for transference to the driver, exactly equivalent, in my opinion, to the corresponding devices in the complainants' patent; they are not identical certainly. There is considerable diversity of form, but entire equivalency. If any mode could be devised for carrying out this essential feature of the complainants' invention without the combination of mechanism to be found in their device or mechanical equivalents therefor such mode might constitute a new combination, exempt from their prior invention secured to them by their patent; but I am unable to form any clear idea of any such new combination.

Cross-int. 20. Don't you think that the driver must drive the nail

from the nail carrier, and that the machine must have, more-
68 over, more than one nail receptacle adapted to sustain nails of different lengths, and a nail carrier and a driver, and mechanism substantially the same as or the mechanical equivalent of that described in the McKay and Fairfield reissue, in order to constitute a machine substantially the same as that described in the McKay and Fairfield patent and referred to in the second clause of the claim; or, in other words, if you found a machine having more than one such nail receptacle, and a carrier and suitable mechanism adapted to remove a nail from the desired receptacle, but found that the driver did not drive the nail from the carrier, would not this fact alone satisfy you that this machine was substantially different from the machine described in the reissue and referred to in the second clause of the claim?

Ans. In general, I may answer the question affirmatively, but desire to explain that the phrase of said second claim, "and with a driver to drive the nail from the carrier," does not, in my opinion, mean necessarily that the driver must enter a hole in the carrier and follow the nail directly down through the carrier to the leather. The function of carrying may be divided so that that part of said function which relates to the act of selection, and must necessarily be of variable extent, may be performed by one part, and another part of the carrying of fixed extent from one fixed position at which the nail is received from that part of the carrier which performs a variable motion to the fixed position of the nail tube and driver may be performed by another part. The division of this function into two steps does not seem to me to introduce an essential element of variation in the mechanism. It may be introduced for some other purpose quite aside from the purposes of the complainants' invention, as, for instance, the introduction of an awl.

When I first saw this (defendants') machine on the 4th of June, 1880, I discovered that an awl and a driver had to perform each its appropriate work in the very same point of space, and necessarily therefore at different times, so that the awl, after punching a hole, must swing out of the way in one direction (actually toward you as you stand facing the machine) when the part of the mechanism which transferred the nail from the point of selection a little to the right
69 hand of the driver moved toward the left hand, transferring the nail with it to the nail tube and driver. Now, this movement is wholly extraneous to the purposes of the complainants' invention, and is for the purpose of permitting the introduction of another feature, namely, the awl; but for this the point of delivery after selection might, for aught I can see, have been directly opposite the driver, and a nail received "from the carrier" might be driven without this secondary lateral transference. If a nail "from the carrier" be driven by the driver, and such nail has been selected as to length from one of two or more "receptacles adapted to sustain nails of different lengths," and has been carried so as to make selection possible, practicable, and certain, the performance of these functions is, it seems to me, evidence of equivalency in the parts performing them, and conclusive evidence in this

case, where the differences, such as they are, are only formal, while the agreements are material and essential. To summarize my answer, the combination in the second claim is:

First. "A series of nail receptacles adapted to sustain nails of different lengths with or without heads."

Second. "A carrier to remove a nail from either of the receptacles to a position in line with the driver by which it is to be driven."

Third. "A driver."

Of this driver, it is said in the first place to be "to drive the nail," a somewhat superfluous piece of definition, since a driver can do nothing in this connection but drive a nail. It does not drive a nail of one length any differently from what it does a nail of another length. The last words of the claim are "from the carrier," and the whole of what I have called the superfluous definite phrase is "to drive the nail from the carrier." Now, I don't know but the author of this language meant to say that the driver was to go through a hole in the carrier and drive a nail out of it. That is one meaning to be got out of the language, and a perfectly plain and intelligible meaning, if the context justifies and requires it.

Another meaning, which, it seems to me, is not forced, is that a nail "from the carrier" is to be driven by the driver.

The mechanism for selecting and carrying the nail having performed its duty, having caused the selected nail to be placed at the right time in a position vertically under the driver and vertically over the nail tube, so that when the driver descends it must hit the nail on the head and drive it into the leather, it seems to me that the operation is complete, whether, when the driver decends, it finds the nail actually in the carrier or in a piece to which the carrier has transferred it.

More especially is this the case when such transference is for a supplementary purpose, such as the introduction of an awl, which I have already explained.

With this explanation of my view of the intent of the words "to drive the nail from the carrier," I end as I began by answering the question in the affirmative.

Cross-int. 21. Don't you think a machine, in order to embody the invention described in the original letters patent No. 155,962, dated Oct. 13, 1874, and granted to McKay and Fairfield, must have, not only nail-driving mechanism and mechanism for selecting the proper nail from the proper receptacles and for bringing it under the action of the driver, but, in addition, mechanism controlled by the thickness of the stock, and operating to determine the operation of the nail-selecting mechanism? If not, what do you take to be the function of that mechanism which is called in the original patent "a mechanism that automatically determines the position of the upper surface of the parts to be united?"

Ans. To the first part of the question I answer no; I do not think that the original patent is limited to such automatic mechanism as shall directly determine the selection of a nail by the immediate action of the thickness of the stock. The claim which relates to this subject is the second claim, which is as follows:

"2. The combination, with the nail tube and nail driver, of nail receptacles and transferring mechanism, so constructed and arranged and so operating that the nails are selected in accordance with their respective lengths, and are transferred and positioned to unite parts corresponding in thickness to the length of the respective nails."

I believe Mr. Renwick and I have concurred in exact terms in the opinion that the mechanism by which the nailways, which I have styled nail carriers, in defendants' machine are at certain times fixed and at certain other times released and moved, may fairly be called automatic;

71 I see nothing in the language of the second claim of said original patent which limits said claim to machinery operated automatically by the thickness of the stock. Indirectly the thickness of the stock determines the action of the automatic mechanism in defendants' machine, by causing the defendant to set it in train to act automatically.

As for the second part of the question, the language quoted in the question is from the specification, and not from the claim, and describes the operation of certain automatic mechanism, the function of which is to cause the selection of a nail of proper length to suit the thickness of the stock, covering that mode of automatic selection adopted in defendants' machine. So far as it goes, defendants' automatic device is exactly equivalent to the automatic device set forth in said original patent.

JOHN C. HOADLEY.

Attest: HENRY C. MERWIN,
Special Examiner.

Deposition of Hadley P. Fairfield.

Direct examination by ELIAS MERWIN, Esq., of counsel for complainants.

Int. 1. What is your name, age, residence, and occupation?

Ans. Hadley P. Fairfield; fifty-four; West Medford, in this State; mechanical draftsman.

Int. 2. Are you one of the patentees of the McKay and Fairfield reissue No. 7014, and do you understand the invention therein described?

Ans. I am one of the patentees, and I understand the invention.

Int. 3. Have you any pecuniary interest in said patent or in this suit?

Ans. No.

Int. 4. What experience have you had in machinery, especially that relating to the manufacture of shoes, and as an expert in patent causes?

72 Ans. I have learned and worked at both, as journeyman and foreman, the trades of pattern-maker and machinist, and for the last ten years I have been almost exclusively engaged

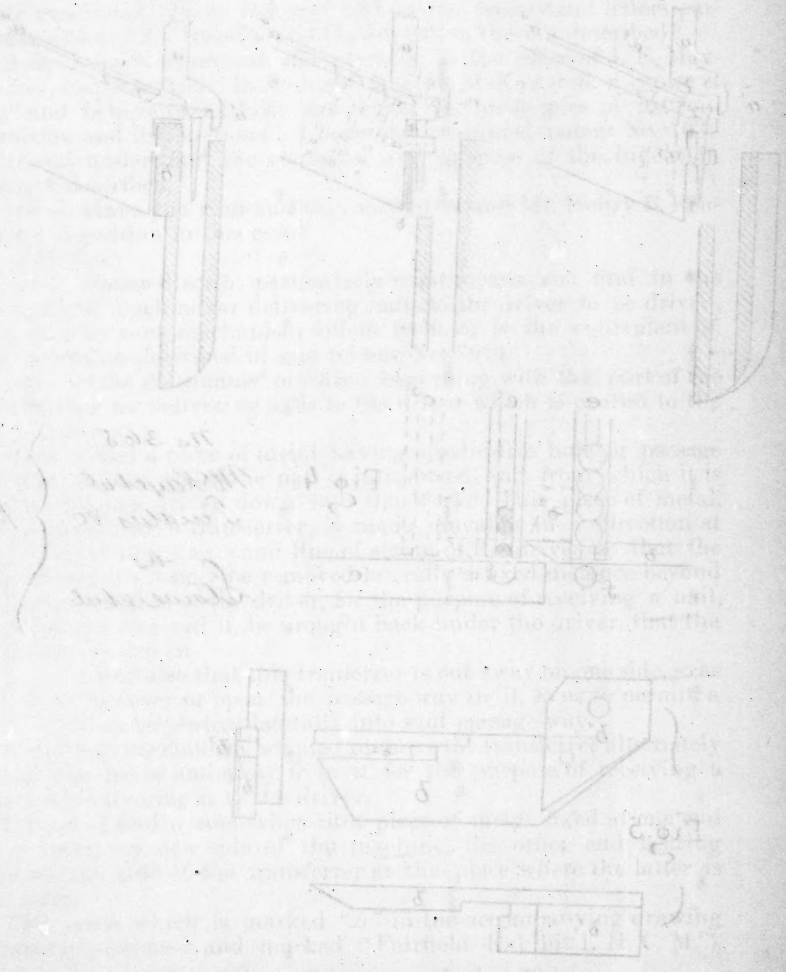


Fig. 1.

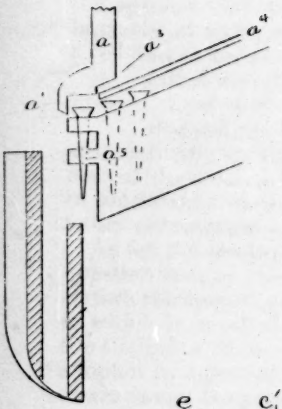


Fig. 2.

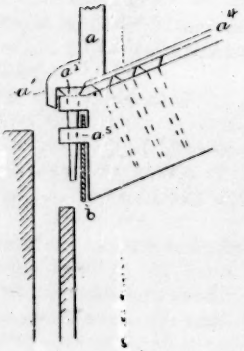


Fig. 3.

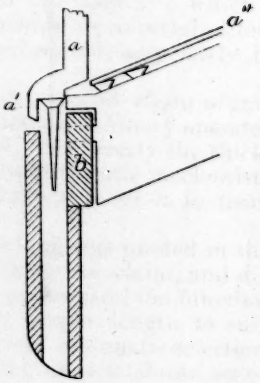
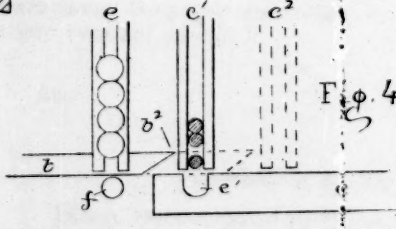


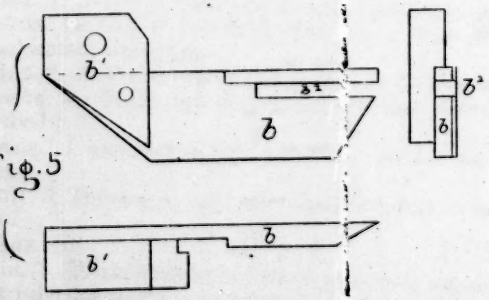
Fig. 4.



No. 365.
McKay et al.
Trustees &c.
vs
Stowe et al.

} D. 7.3

Fig. 5



in designing and constructing boot and shoe machinery, including both nail and pegging machines.

I have had considerable experience in the analysis of patents, and have testified in two instances as expert in infringement cases; and I have also testified several times in interference cases. I have made several inventions for which I have received letters patent.

Int. 5. Have you examined, and do you understand, the defendants' machine? Have you read and do you understand letters patent to Goddu, No. 163,474, and the invention therein described?

Ans. I have examined the machine at the office of J. E. Maynadier, Esq., marked "Defendants' Exhibit McKay *et al. v.* Stowe *et al.*," and believe that I fully understood the principles of its construction and its functions. I have also examined patent No. 163,474, and understand the character and purpose of the invention therein described.

Int. 6. Have you read and do you understand Mr. Henry B. Renwick's deposition in this case?

Ans. Yes.

Int. 7. Please describe particularly what means you find in the defendants' machine for delivering nails to the driver to be driven, and how far such mechanism differs from, or is the equivalent of, the invention described in said reissue No. 7014.

Ans. In the defendants' machine, beginning with that part of the mechanism for delivering nails to the driver which is nearest to the said driver—

First. I find a piece of metal having a cylindric hole or passage through it, into which the nail is introduced, and from which it is driven by the driver down into the work. This piece of metal, which I will call a transferrer, is made movable in a direction at right angles to the axis and line of action of the driver, so that the passage-way in it may be removed laterally a fixed distance beyond said line of action of the driver, for the purpose of receiving a nail, and, having received it, be brought back under the driver, that the nail may be driven.

I find also that this tranferrer is cut away on one side, so as
73 to uncover or open the passage-way in it, so as to permit a nail to be pushed laterally into said passage-way.

I find also mechanism adapted to move the transferrer alternately under the driver and away from it, for the purpose of receiving a nail and delivering it to the driver.

Second. I find a somewhat thin piece of metal, fixed at one end to a lever, on one side of the machine, the other end bearing against the side of the transferrer at the place where the latter is cut away.

This piece, which is marked "*b*" in the accompanying drawing (drawing produced and marked "Fairfield Exhibit 1, H. C. M."),

[Here follows diagram marked p. 73.]

has sufficient motion imparted to it by the lever to fully uncover the vertical passage in the transferrer, marked "I" in said drawing, at the time when the latter is farthest from the driver, and then,

after the transferrer has received a nail, to again cover up or close in the said passage, and keep it closed while the nail is carried under the driver and driven, and until the said transferrer is again returned to receive a nail.

The piece *b* performs also the function of a separator, and for this purpose its end is made wedge-shaped, and as it passes forward to cover the vertical passage in the transferrer it passes between the endmost nail and the others of a column of nails, supported by their heads on nailways, which I will describe hereinafter, and pushes or wedges this endmost nail off of the nailway into the passage in the transferrer.

The motion of the separator is parallel to that of the transferrer and substantially at right angles with the length of the nailways.

Third. I find a device, marked "*a*" in the accompanying drawing, having a vertical motion, and adapted to prepare the endmost nail supported on the nailway for the operation of the separator. It has a vertical finger, marked "a^1," which projects down by the lower end of the nailway. This finger hinders the endmost nail from falling off the nailways prematurely, or from going off side or head down.

Above the finger is a projection, marked "a^2," on the side toward the nailways, which, as it is pressed down upon the endmost nail, forces said nail to take a position so that its point may not lie across the path of the separator *o*. After the thin end of the separator has entered behind the endmost nail, and as the wedge begins to
74 push the nail off the nailway, the device *a* moves in harmony with the nail first off the end of the way and then down, the projection a^2 insuring that the head of the nail shall not project above the top of the transferrer so as to hit the driver when moved under it. The function of this piece *a* is to assist in the operation performed by the separator and closer rather than to perform any independent work of its own.

Fourth. I find two nailways, secured together side by side, and capable of being moved in a line parallel with the movement of the transferrer and separator, and just so far as that the ends of the nailways may alternately be brought opposite the place where the vertical passage in the transferrer is brought when it is moved by the driver to receive the nail.

These nailways are each formed of two thin strips of metal, fixed just so far apart that nails may by their gravity drop down between them, all but their heads, which cannot go between them, and, consequently, ride upon the upper edge of the ways. These ways are inclined downward toward the passage in the transferrer at an angle of twenty or thirty degrees with the horizon, so that the column of nails will by their gravity, aided by the jar of the machine, move easily and certainly down toward the transferrer and separator.

There is mechanism provided to effect the movements above described.

Fifth. I find beyond the nailways the device called by Mr. Renwick a hemispherical hopper, and correctly described by him.

Turning to the reissue 7014 of United States patent 155,962, and

commencing as before with that part of the mechanism which delivers nails to the driver nearest the boot or shoe to be nailed—

First. I find in the reissue a piece marked "*t*," and called a carrier, and which is described as constructed of two circular rings, a cylindrical box, having reciprocal motion around its axis for the purpose of bringing a vertical slot, g^2, in the outer ring and a nail-carrying groove, h^2, in the inner ring first opposite to one of a gang or series of nailways and then under the driver for the purpose of alternately selecting a nail of the proper length for the thickness of stock to be nailed and transferring it to a position under the driver that it may be driven. The inner ring of this carrier is in
75 character and office the exact equivalent of the transferrer which I have described in the defendants' machine, and its nail-carrying groove h^2 is the equivalent of the vertical passage in the said transferrer.

Second. I find the outer ring of the plaintiffs' carrier to move in contact with the inner ring in such a way as to uncover the groove h^2 in the inner ring after the said groove has been placed opposite to one or either of the nailways to receive a nail, and, after a nail is received, to again cover the groove and keep it covered until the nail is driven out by the driver. And in so far as the covering and retaining the nail is concerned the outer ring operates just as does the separator in the defendants' machine. The function of pushing off the nail from the nailways into the transferrer, or inner ring of the patentees' invention, is performed by a spring or finger marked i^2. This is accomplished by passing between the endmost nail and the others of a column of nails supported on the nailway, or, in the language of the reissue, it passes back of the nail to be selected, and, as the slot g^2 is opened, pushes the nail into the groove h^2. A nail trough with a series of nails and a wedge-shaped separator for entering behind the endmost nail of a series of nails and pushing it out were well known at the date of the plaintiffs' patent.

For example, such a device is shown in United States patent No. 12832, dated May 8, 1855.

This spring i^2 might, so far as its operation on the nail is considered, have been fixed to the outer ring or to the carrier shaft. The only objection to this is that if so fixed it must have made equal, angular motion with the part to which it was fixed, and, consequently, when the groove h^2 was under the driver the finger i^2 would have been in the same radial line, and just in the place occupied in the drawing by the vertical part of the driver or nail tube marked *s*. Hence the part *s* would need to be moved farther from the carrier, and be made stronger, in order to resist the strain of its pressure on the work, which strain is applied through the said part *s* and a nail-tube foot marked *f*. This provision of space for i^2 would make the piece of which *s* is a part more costly and more clumsy. Still, as a skilled mechanic, I should say that neither method for attaching the spring i^2 had any great advantage over the other. The patentees elected that the finger or spring should
76 move with the carrier only so far as should insure the pushing off of the nail, and have provided for the purpose of let-

ting it rest during the remainder of the motion of the carrier, the mechanism provided being described and figured, a^2, w^2, v^2, x^2. The pushing off of the nail from the nailways into the transferrer I have said is performed in the defendants' machine by the separator. I consider this separator an exact equivalent for the outer ring and spring i^2 of the reissue, which I have shown might just as well have been pieces rigidly connected together, so as to be in effect one piece.

I find, then, that the mechanism for taking the nails from the nailways and transferring them to the driver is substantially alike in both machines, and is operated in the same way, for the same purpose—that is, it consists in introducing the point of the well-known wedge-pointed separator behind the foremost nail, and between it and the one next behind it, then moving the separator substantially at right angles with the length of the ways, and thereby pushing off the nail from the end of said ways into the nail receptacle, which at that time is brought opposite to the end of the nailway opened and ready to receive the nail.

There is a difference in the line of movement of these equivalent parts of the two machines, which I do not consider important. It is this:

In the patentees' machine the motion is circular—that is, it is around the carrier—while in the defendants' machine the motion is in a straight line.

There is also in the patentees' machine a rubber or friction pad, not described or lettered in the reissue, but so clearly shown in Figs. 1, 2, 3, 4, and 5 that I judge no skilled mechanic would fail to see its object or be in doubt as to its construction. Its object was obviously to hold the outer ring of the carrier at rest by friction between the parts until motion should be conveyed by the inner ring to the outer ring, by the contact of the pin and slot figured t^2, just as in the device for moving spring i^2, which is lettered in the reissue u^2, v^2, w^2.

The nailways or receptacles of the plaintiffs' machine are arranged radially round the circular box called in the reissue "the carrier."

77 They are inclined downward the carrier, and are adapted to sustain columns of nails of different lengths, as described in said reissue.

They are practically of the same construction and for the same purpose as those in the defendants' machine, and are in the two machines the equivalents of each other.

Considering that a nailway, a separator, and a carrier were old, and had been used in machines for driving a single length of nails, or in machines for separating and working upon pins or screws, it seems to me that the invention made by the patentees consisted in introducing two or more nailways, each containing nails of different lengths from the others, and in providing between the ends of these nailways, on the one hand, and the transferrer and separator, on the other hand, the requisite amount of relative motion, so that the end of either nailway might be brought into proper juxtaposition with a transferrer which shall receive the nail and de-

liver it under the driver, and with mechanism to push the nail from the nailways into the transferrer, and whether this precise and requisite amount of motion be given to the one part or the other is not material. I therefore find that the two machines equally accomplish the purpose of the invention, and do it in the same way.

Int. 8. Mr. Renwick, in his answer to Int. 4 in his deposition, expresses the opinion that the machine described in said reissue No. 7014 is inoperative to drive nails, for certain reasons which he gives. Please give your opinion on this point with your reasons.

Ans. I have read Mr. Renwick's answer in his deposition to Int. 4. It seems to me that the principal difficulties which he apprehends in the operation of the plaintiffs' machine are due to an inexact knowledge of the state of the art at the time of the invention and to a misconception as to the kind of nails to be used. Before the date of the McKay and Fairfield patent cylindric nails with clinching points were well known. Such nails are described in United States patents Nos. 85374 and 86832, dated respectively Dec. 29, 1868, and Feb. 9, 1869, and nails cut from corrugated or twisted wire approximately cylindric in form were already used in the Blake and Libby and cable wire nailers. From the description in the patent alone I should say that one object of the invention was
78 to provide a mechanism capable of successfully handling this kind of nails.

The inventors have also provided, by a modification of the machinery for handling the nails, means so that the operation of selection, which is the chief object of the invention, may be performed in the same way upon headed nails.

United States patents Nos. 12985, of May 29, 1855, and 33151, of Aug. 27, 1861, both show a flexible follower capable of keeping by continuous pressure a column of headless nails erect in a nailway or trough, and permitting the foremost nail to be picked off when wanted, without allowing the irregular and uncertain operation described in page 33, lines 9–21, of Mr. Renwick's answer. Machines had also been invented and patented by Knowlton, myself, and others for handling headless, prismatic nails, or those shaped like a common board nail without a head.

As to the difficulty which Mr. Renwick apprehends in the operation of the spring or picker i^2, I notice two features, the first of which, relating to the imparting of motion to it, I have already alluded to in the answer to the previous interrogatory; the second, with regard to its performance of the duty required of it, I will now consider.

(Adjourned.)

BOSTON, *April* 15, 1882.

At the time of the McKay and Fairfield invention a device which is now sometimes called a picker, and sometimes a separator, was well known. This device was of the nature of a wedge, and operated to push a nail, screw blank, or pin from receptacles or nailways into a tube, or other device, to be further operated upon. This

pushing was accomplished by entering the thin end of the wedge between the endmost and next behind it of a column of nails, and, by further movement of the wedge, forcing the nail off the end of the nailway, very much as a wedge is driven between any two things in order to separate them.

In United States patents Nos. 128,52 and 135,329 devices are shown operating in this way. Now, in the McKay and Fairfield machine it is only necessary, to insure its perfect operation, that this wedge should have the quality of a spring, so that it may yield
79 in passing behind a nail for which the passage in the transferrer is not yet open; and when the passage is opened, the force stored, while the spring yields, may be exerted to push out the nail, as described. The particular novelty introduced by McKay and Fairfield in this particular device was not in altering the operation of the well-known picker in its general functions, but in forming it as a spring instead of a rigid bar. I conclude, therefore, as a skilled mechanic, that Mr. Renwick's objections are groundless, and that there would be no difficulty in making, by the aid of the description and drawings of the reissue, an operative machine which should perform the duties assigned it. I have verified my opinion by observation of working models of these parts, of practical working size, and of such a construction as a workman skilled in the art would naturally and without invention make if directed to follow the instruction of the patent, read in the light of the existing knowledge.

I allude to exhibits marked respectively "U. S. C. C., Dist. of Mass., McKay *et al. v.* Stowe *et al.*, Complainants' Model No. 1, H. C. Merwin, special examiner," and "U. S. C. C., Dist. of Mass., McKay *et al. v.* Stowe *et al.*, Complainants' Model No. 2, H. C. Merwin, special examiner."

Int. 9. Turning now to the sixteenth claim of said Goddu patent No. 163,474, and Mr. Renwick's testimony relating thereto, please state whether you agree with, or differ from, the opinion expressed by him, that the defendants' machine does not contain the combination described in said sixteenth claim, and your reasons.

Ans. I have examined the Goddu patent with reference to its sixteenth claim, and also Mr. Renwick's testimony relating to it. Turning to said patent, and considering the state of the art when the application was made for it, I find that the invention made by the patentee consisted, among other things, of co-operating mechanism, the object of which was to enable an operator using a nailing machine adapted to drive different lengths of nails to apply at will, and without regard to the relative condition of the parts of said machine, a power or force sufficient to withdraw from the action of the machine one length of nails and to substitute therefor another length, and also, in order that the change may be made safely, without breaking or clogging the machine by making it at
80 an improper time, to store or hold back the changing force until it may safely be applied, and then to automatically liberate it and permit it to operate.

The essential requisites of this co-operative mechanism are, first,

two ways or receptacles for different lengths of nails or nail material, so secured together as to have no motion with relation to each other, but to have a common movement of such nature that they may be alternately presented to the nail selecting and driving mechanism. Second, mechanism so connected to the ways or receptacles as to convey its motion to them, which mechanism is capable of receiving from the operator, and of exerting alternately in contrary directions, a force sufficient to shift the ways or receptacles. Third, of a locking device taking effect between the nailways and some part of the machine which is unyielding in the direction of the reciprocal movements of the said nailways.

This co-operative mechanism has been very well described by Mr. Renwick, save as to the upper arm of the rocker shaft, which he makes to correspond in function with the handle *v* in Goddu. This hypothesis cannot be correct. The rocker arm with its connection with the nailways is what conveys to the nailways the force applied alternately in contrary directions at the other end of the train of mechanism. In Goddu's machine the piece B performs this function, while the piece *v* is at the extreme end of the train, and in function corresponds to the treadle mentioned as not being in place in Exhibit Defendants' Machine. The fact that it is the operator's hand which conveys the power to the train in one case, and his foot in the other, cannot be material. The locking device in the two machines Mr. Renwick has also described. In the defendants' it is a bolt or pin withdrawn at the proper time; in Goddu's it is the nail strip cut off at the proper time. Mr. Goddu has utilized the accident that the projecting nail strip in his machine was sufficiently strong to resist, without injury to itself, the force which, when such projection was removed, would overcome the inertia and friction of the nailways and connected parts and give the required motion. Had it been otherwise he could have used an independent similar device, which was stronger; and to avoid the waste incidental to the cutting off of the equivalent of the nail strip in this supplemen-
81 tary device, he could, without further invention, have withdrawn it, as is done by defendants. I consider the locking devices in the two machines as fully the equivalents of each other.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for defendants:

Cross-int. 10. You haven't read either of the depositions of Mr. John C. Hoadley in this case, have you?

Ans. I have read just what he says about the spring i^2; nothing more, I think. I believe I read about the friction pad, too.

Cross-int. 11. You think, if I understand you, that the nailways in the defendants' machine are the equivalent substantially of what are called receptacles *v* in the complainants' reissue, and that what you have called a "transferrer" in defendants' machine is the equivalent substantially of the nail carrier *t* of the complainants' reissue?

Ans. Yes, sir.

Cross-int. 12. What is the equivalent, in your opinion, in the defendants' machine of that train of mechanism in complainants' reissue which operates, according as the stock varies in thickness, to bring the recess h^2 of the carrier t to rest in the proper relation with one or the other of the nailways or receptacles v?

Ans. In the McKay and Fairfield reissue the positioning of the nailways so as to receive the proper length of nail for the thickness of stock to be operated upon is made to depend automatically upon the thickness of the stock itself, as in the Blake and Libbey invention, while in the defendants' machine it depends upon the will of the operator.

I do not find in the defendants' machine this automatic selection at all; but, as I see the subject, the function of selecting the proper length of nail by presenting the proper nailway opposite to the passage in the carrier is performed in the defendants' machine by the means of the movement imparted to the oscillating nailways, which begins with the bell-crank lever spoken of by Mr. Renwick and ends with the treadle not in place on the machine.

82 Leaving out the automatic character in the patentee's machine I can see that this train of mechanism is the equivalent of that inquired about.

Cross-int. 13. You say one function of the projection a^2 of finger a in Fairfield Exhibit No. 1 is to force the nail down into the hole through the transferrer, so that the head shall not project; don't you think, on reflection, that you are wrong as to this; and, if not, please reconsider it and state whether it isn't now clear to you that the downward motion of the finger a, as shown in the drawing Fairfield Exhibit No. 1, is altogether too small to crowd a nail, supposing it was a little too large for the hole in the transferrer, down any farther than is shown in Fig. 3 of the drawing Fairfield Exhibit No. 1; and, moreover, isn't it certain that the hole in the transferrer must be larger than the driver and that the driver must be larger in diameter than the largest diameter of the nail, and that there is nothing whatever to prevent the nail from falling point first away from the finger a when it is released from the nailway?

Ans. This drawing, Fairfield Exhibit No. 1, was not made to scale from the machine. Possibly it does not represent the correct relative size of the finger a and it may not correctly represent the position of the top of the transferrer with relation to the end of the nailway; as shown in Fig. 3, it could go but very little way farther down, not sufficient to put the head below the top of the nail tube.

The hole in the transferrer must be larger than the driver, because the driver must go down through it. It is not essential that the driver be larger in diameter than the head of the nail in conical headed nails of somewhat large size.

Most of the nails would fall freely through the passage in the transferrer; occasionally one would stick a little; this would have to be pushed through by the driver. Very rarely in practice is the head of a nail so large as not to be pushed through without breaking the driver.

Cross-int. 14. In your opinion is this a correct comparison of the two machines, namely: the transferrer and its throat of defendants' machine are substantially the same as the cylinder and its groove h^2; the picker in defendants' machine is substantially the same as the thin cylinder and its slit g^2; the finger in defendants' machine is
83 substantially the same as the spring i^2, and the nailways of defendants' machine are substantially the same as the nailways v?

Ans. I consider that the transferrer and its throat in defendants' machine are substantially the same as the inner cylinder and its groove h^2.

The function performed by the picker in defendants' machine is, in my opinion, performed by the thin cylinder and its slit g^2 and the spring i^2, acting together, in the complainants' machine.

Whatever effect the finger a of Fairfield Exhibit No. 1 has upon the head of the nail by frictional contact tends to assist the movement of the nail by the picker, but its chief function is in preparing the said nail for the operation of the picker. And a nailing machine may operate with perfect success where the picker with its operation of pushing off the nail from the end of the nailway is not supplemented by such assistance. This I know from experience: The nailways of defendants' machine are substantially the same as the nailways of complainants' machine.

Cross-int. 15. Mr. Hoadley has argued with great ingenuity, as I understand him, that the lower portions of the nailways in the defendants' machine, meaning substantially about all of the nailways which lie outside the hopper, are the same thing in substance as the nail carrier t of your reissue; this is not so, is it, in your opinion?

(Objected to because the assumption in the question is incorrect according to the complainants' understanding of Mr. Hoadley's testimony.)

Ans. It is not.

Cross-int. 16. Did you ever see one of the machines described in the reissue in operation?

Ans. Not an entire machine. We made parts of machines of operative size to satisfy ourselves that a practical working machine might be made on that plan.

Cross-int. 17. Who made the small model on file in the Patent Office?

Ans. It was made at the shop of W. W. Chipman. I don't know the name of the workman.

Cross-int. 18. And what was it made from?

Ans. Sketches that I made for the purpose.

84 Cross-int. 19. When were these two models made—Exhibits Models 1 and 2?

Ans. I don't know exactly. I think within the last two or three months, since Mr. Renwick's testimony.

Cross-int. 20. It seems to me a little singular that a man of your soundness of judgment and skill in these matters should regard the nail strip in the Goddu patent as substantially the same thing as the

locking bolt in the defendants' contrivance; please reconsider this matter and state why it is that you do not think that the cutting off of the projecting part of the nail strip and driving it into the shoe shows conclusively that it is a radically different thing from the defendants' locking bolt; and also, where you find in the Goddu patent anything at all resembling the cam and connecting levers by which the locking bolt is actuated in the defendants' machine; and also what it is that justifies you in believing that the cutters, nailways, and projecting nail strip in the Goddu patent are substantially the same in function, mode of operation, and result as that part of the frame of the defendants' machine through which the locking bolt passes, and that part of the under side of the nailways into which it passes, and the locking bolt.

Ans. With regard to one of my soundness of judgment and skill in these matters making so great a mistake, I find that my superior, Mr. Henry B. Renwick, as I understand his evidence, asserts that "the jaws and the strip projecting between the jaws are elements of the combination referred to in the sixteenth claim of the Goddu patent." If they are an element of the combination as claimed the function performed by their relative operation is most certainly to prevent the movement of the nailways when they ought not to move. I fully believe myself that he is correct in that matter. Now, this function is performed in the defendants' machine unquestionably by the co-operation of the bolt and the hole to which it is adapted to fit. When the object is to remove an obstruction I do not consider it important how it is removed, providing it is so removed. Now, I understand that it is a chief object of the invention, as shown in this sixteenth claim, to obstruct the movement of the nailways until the proper time has arrived to move them, and then to remove such obstructions. In my mind this is the radical thought in that part of the invention. With this thought in view, I should say that the operation of the cutting jaws which removed the obstruction was equivalent in function with the mechanism in defendants' machine for removing the bolt. What justifies me in believing that the cutters, nailways, and projecting nail strip in the Goddu patent are substantially the same in function, mode of operation, and result, so far as effecting this stopping and releasing of the nailways is concerned, as the parts that perform this operation in the defendants' machine, is that I find no other function that they perform. The manner of operation of both of them is exactly analogous to the bolt of a lock and a mortise to receive it on an ordinary door.

HADLEY P. FAIRFIELD.

Attest.: HENRY C. MERWIN,
Special Examiner.

Deposition of Gordon McKay.

Direct examination by ELIAS MERWIN, Esq., of counsel for complainants:

APRIL 18, 1882.

Int. 1. State your name. Are you one of the plaintiffs in this case?

Ans. My name is Gordon McKay. I am one of the plaintiffs in this case.

Int. 2. Are you one of the patentees in the McKay and Fairfield reisssue, and do you understand the invention therein described?

Ans. I am, and I do.

Int. 3. What is your profession, and what experience have you had in machinery, especially in that relating to the manufacture of boots and shoes, and as an expert in such matters?

Ans. I have been a civil engineer; I am now a mechanical engineer. I have been engaged for twenty-three years in inventing and making principally shoe machinery, especially sewing and nailing machines. A large part of my business has been to study and analyze patents, and I have been called upon to testify in reference to such matters more or less. I have received many patents
86 as a sole or joint inventor, and am one of the inventors of the machine known as the McKay sewing machine.

Int. 4. Have you examined and do you understand the defendants' machine; have you read and do you understand letters patent to Goddu, No. 163,474, and the invention therein described?

Ans. I have examined and understand the defendants' machine, particularly that part in contest in this suit, and I have read and understand the Goddu patent inquired of.

Int. 5. Please describe particularly what means you find in the defendants' machine for delivering nails to the driver, and how far such mechanism differs from, or is the equivalent of, the invention described in said McKay and Fairfield reissue No. 7014.

Ans. In the defendants' machine the nails (which are nails having enlarged heads like wood screws) are placed in "hoppers," as Mr. Renwick calls them. Of these there are two. The nails are put into them by the attendant, and he puts in one nails of one length, and in the other nails of another length, but all the nails in either hopper are of the same length. These nails are, by a contrivance working in these hoppers, carried up and dropped into nail receptacles, of which there is one in each hopper. These receptacles are made with two sides, having the space between them of about the diameter of the nail's shank (or part under the head) and less than the diameter of the head, so that nails dropped into them cannot fall through, but will hang supported by the heads. These receptacles extend from the hoppers, slanting downward toward the driving apparatus, in the form of nailways, to a position where the selection of nails of different lengths is to be made. The upper end of these receptacles, that part within the hoppers, has the sides carried higher up, and inclined outward, so as to catch the nails dropped into them, and cause them to roll down to the bottom of this inclined surface, and there arrange themselves in a direction parallel to the opening between the sides of the receptacles, when the shanks and points of the nails drop into this opening and the nails then hang by their heads. There is in the hopper an opening large enough to admit these receptacles and allow them a sidewise movement. A thin cover attached to the receptacle closes the part of this opening which the receptacle does not occupy.

87 A jarring vibration is given to these receptacles by a hammer, or rapping piece, which, together with gravity, causes the nails to slide down towards the lower end of the receptacle or way. The nail at the lower end of the receptacle or way is arrested (in the receptacle not in use for the time being) by butting against the separator, and, at the lower end of the one in use, by a piece I designate as a "plunging stop," which is so formed that a part of it extends down below the top of the nail receptacle and closes the end of it. Thus, referring to Fairfield Exhibit No. 1, H. C. M., special examiner, *a*, Fig. 1, is the "plunging stop." This has a motion up and down in a vertical path, and it has, besides, a forward-and-back motion, so as to come into the position seen in Fig. 3.

The lip a^1 arrests the nail when it is coming down. The plunging stop *a* then has a slight motion downward, and the parts assume the position seen in Fig. 2.

The horizontal part a^2 bears against the head of the last nail, and the part a^3 bears against the spring cover a^4, and presses it against the head of the nails, and causes the points of the lower two nails to separate and make room for the edge of the separator *b* to enter between them, as shown in Fig. 2.

The plunging stop *a* is now pushed forward and downward at the same time, and the separator *b* is pushed forward between the nails, and, by its wedge-shaped end, pushes the nail into the carrier, as seen in Fig. 3. A top view of these parts is seen in Fig. 4, where I have taken away the plunger stop *a* and the spring cover a^4, and removed the heads of the nails in the receptacle from which the nails are being taken. *c*, c^1, Fig. 4, are the two receptacles, c^1 being the one in use at this time; *b* is the separator, and in side elevation is shaped as shown in Fig. 5. The end b^1 is a wedge. b^2 is a slot in the separator through which the projection of the side of the receptacle a^5, Figs. 1 and 2, passes. *e*, Fig. 4, is the transferrer, and has in it a recess, e^1. The separator *b* has a motion towards *x* and takes the position shown by the dotted line. In so doing it is obvious that the wedge-shaped part of it will have pushed the nail into the recess e^1 of the transferrer *e*; *e* now, has a motion towards *f*, the nail tube, and e^1 and the nails in it are carried over the nail tube *f*, and the driver, which is in the machine directly over

88 *f*, comes down on the nail and forces it into the shoe. Now, when it is desired to take a nail of a different length—that is, one from the receptacle *c*, both the receptacles are moved to the right, *c* occupying the place before occupied by c^1, and c^1 going to the dotted line c^2.

The separator *b* and the transferrer *e* now take a nail of the other length and from the other receptacle, all the parts assisting in this process acting in the same way they did when taking a nail from c^1, the difference being that the relative position of *c* and c^1 on the one hand and the parts *b* and *e* on the other have been changed, so that *c* now occupies the place of c^1, and the parts *b* and *e* now take a nail from *c*. These parts which, and the action of which, I have just described, consisting of *c*, c^1, *b*, and *e*, perform the work of selection, taking nails of one length from one receptacle, or nails of another

length from the other, and carrying them to the driver. Having thus described the parts and the mechanism of defendants' machine which carry the nails from the hoppers to the receptacles and through the receptacles to the selecting mechanism, and having shown how by means of the selecting mechanism a nail of one length or another is taken from its appropriate receptacle as the varying thickness of the shoe requires, and how it is put into the transferrer, and by it conveyed to the nail tube, and finally driven into the shoe by the driver, I will now describe the plaintiffs' invention.

Reissue 7014 shows a series, two or more, of receptacles, the same as those in the defendants' machine, being ways along which the nails slide, except that there are no hoppers at the upper end of these ways. The nails in these receptacles are of different lengths, each receptacle containing nails of the same length that slide along these ways, as in the defendants' machine, to a place near the driver, where the selection is performed. The ends of these receptacles are arranged in a circle, and abut against the cylindrical cover to the recess in the carrier, which prevents the nails from dropping off the ends of the receptacles. The carrier is also cylindrical. There is in the plaintiffs' machine a separator consisting in the point which forms the end of the spring i^2, which acts to take a nail from the end of the requisite receptacle, and, entering between the end nail and the one next to it, tends to put it in the recess in the carrier when
89 properly presented and open to receive it. There is a cylindrical cover to this recess in the carrier, which closes as soon as the nail is put in by the separator. The carrier has an oscillating motion on its axis—that is, it turns a little to the right and back a little to the left. This motion of the carrier or transferrer starts from the position where its nail-holding recess is directly over the nail-tube and under the driver, so that whatever nail may be in it will be driven into the shoe. The nail having been driven, the transferrer then goes to take a fresh nail. For this purpose it moves and then stops, and the place where it stops I will call the place of coincidence. The length of the motion is variable, and thus the place of coincidence is caused to be sometimes opposite one nail trough and sometimes opposite another. The spring i^2 and connected parts then operate to push into the recess the end nail from whichever trough or receptacle may be opposite to it. Thus the position of the place of coincidence with relation to the gang or series of troughs determines whether the nail shall be taken from one trough or another—that is, whether a longer or shorter nail shall be selected. Thus a relative motion is set up between the nail-receiving recess and the troughs. The selection is determined by the variable extent of that motion—that is, by the relative position of the nail-receiving recess and the several troughs when that motion ceases and the parts come to rest. The place of coincidence in the plaintiffs' machine is moved in relation to the ends of the receptacles or troughs, so as to be opposite one or the other, as a long or short nail is required. In the plaintiffs' machine this place of coincidence is movable and the receptacles are fixed, and in the plaintiffs'

machine the thickness of the material itself automatically determines the position of the place of coincidence; but as the mechanism by which this is done forms no part of the present contest, I will not describe it.

When the nail has been selected from the proper receptacle and carried over the nail-tube and under the driver the driver is forced down and drives the nail into the shoe. I will now consider how far such mechanism of the defendants differs from, or is the equivalent of, the invention described in reissue 7,014. Commencing with the receptacle (for the hoppers are not shown in complainants'
90 reissue 7,014, and, being mechanism old in the art, do not form a part of the invention therein described). I find the receptacles the same in each, and each contains nails having enlarged heads, and in each the nails are carried towards the carrier by gravity—in the defendants' machine aided by a rapping given by a hammer, and in the plaintiffs' having the same results accomplished by the natural jar of the machine when running, which, from observation, I know to be sufficient for the purpose.

In each machine there are several receptacles, and each receptacle contains nails. Each receptacle contains nails, but of one length. The different receptacles contain nails of different lengths. This is accomplished by causing the attendant to put into each of the receptacles nails of the length intended for it. This prearrangement of the nails is essential for the subsequent operations of the selecting mechanism, and is found the same in each machine. I now come to the place where the selection is to be made, and I find this similarity—I find in each machine the following: Two nail receptacles, each filled with its own appropriate length of nails, [and] abutments to prevent the nails from tumbling out of the ends of either receptacle.

These abutments or closing devices are removed from the receptacle or trough from which the nail is to be taken, and at the instant of taking. In both machines this is essential to the operation. In both machines it is found, and in both machines it is automatically operated. In each machine there is a separator, acting to push the nail from either receptacle into a recess in the carrier. In the plaintiffs' machine this is the spring a^2; in the defendants the piece *b*. In each machine there is a carrier or transferrer consisting of a block with a recess to receive the nail, and acting by a reciprocating motion to carry a nail to the driver from either receptacle as it is delivered to the carrier by the separator. There is in each machine a cover for the recess in the carrier, which closes when the nail has been put into it by the separator, and which retains the nail in the recess while it is being carried by the carrier to the driver.

I find that in both machines the separator is made to take the end nail from one receptacle or the other by bringing the recess in the carrier and the end of the receptacle from which a nail is to be taken into juxtaposition, both machines having a relative motion
91 between the receptacle and the carrier, by means of which the selection is accomplished. In both machines there is a carrier which has a motion for each nail from the place where the

nail is received in its recess to the driver and back again to a position opposite to the nail to be next carried; and at that place in both machines the carrier has a rest till the separator puts the desired nail in the recess in the carrier. This rest, which I have heretofore called the place of coincidence, occurs when the recess is opposite the end of the receptacle from which the nail is to be taken, be it one or the other, and as there are two receptacles, and in different places—that is, one by the side of the other—it is obvious that the point of rest or coincidence must be now opposite one trough and now opposite the other, according as the nail is to be taken from one or the other. That the point of coincidence is at the proper time opposite one trough or another determines the selection of one nail or another

I find in both machines that this change of relative position occurs, and that in both it is what determines the selection.

In the plaintiffs' machine the troughs are always in the same place, and the point of coincidence is determined by varying the position of the recess at the instant of separation. In the defendants' machine the nail-receiving recess always occupies the same position at the instant of separation, and the coincidence is determined by varying the position of the troughs at this instant. As this operation depends upon the position of these parts in relation to each other, it is obvious that it is not material whether the movement of the requisite kind be given to one or the other; and therefore I consider that such a change does not detract from the identity of the machines. I find also this difference—that in the plaintiffs' machine the carrier and recess cover have a reciprocatory motion from the trough to the nail tube, in an arc of a circle, while in the defendants' this reciprocatory motion is in a straight line; but this I do not consider as material in the question of infringement, they being well-known equivalents, and have been used before the plaintiffs' invention, for the same purpose, in nailing machines.

Int. 6. Mr. Renwick, in his answer to Int. 4 of his deposition, expresses the opinion that the machine described in said McKay and Fairfield reissue No. 7014 is inoperative to drive nails, for
92 certain reasons, which he gives. Please give your opinion on this point, with your reasons.

Ans. I find in Mr. Renwick's deposition that he says, page 32, line 2, that he does not understand the mechanism for moving the spring i^2, which, it is stated in the patent, pushes the nail into the carrier, and the mode in which that spring works to perform the duty which it is said to perform. The shape of the end of the spring i^2 is that well-known wedge shape seen in the defendants' separator, and well known and common in nailing machines prior to the date of the plaintiffs' patent; and its operation and means of giving it motion are clearly and accurately set forth in the patent. I notice what Mr. Renwick says of the difficulty he thinks will occur in getting headed and headless nails from the receptacles into the recess in the carrier. In regard to headless nails, they will travel perfectly down the receptacles when pressed by the old and well-known device of an elastic follower acting on the last nail—that is,

the one farthest from the driver—and they will go fairly into the recess in the carrier when acted upon by the separator spring i^2, and will not get crosswise or inclined, so as to impede the action of the machine. In relation to his remarks about the action of the separator i^2 when used for headed nails, in which he says, as before, when speaking of headless nails, he does not understand the mechanism by which it is actuated. To me the action of the mechanism is all clearly described, and when constructed as that language describes the operation is complete, and has none of the imaginary difficulties Mr. Renwick anticipates. I state my opinion as to these points with confidence, for I have seen and operated working models of these two mechanisms, using headed and headless nails, well known and in use at the time the plaintiffs' original patent was issued, which models were constructed like the description in the patent, and operated perfectly. The models I refer to are already exhibits in the case, marked "U. S. C. C., Dist. of Mass., McKay *et al. v.* Stowe *et al.*, Complainants' Model No. 1, H. C. Merwin, Sp'l Ex.," and "U. S. C. C., Dist. of Mass., McKay *et al. v.* Stowe *et al.*, Complainants' Model No. 2, M. C. Merwin, Sp'l Ex."

From my knowledge of the art, I should say that the machine described in the patent would work as described.

93 Int. 7. Turning, now, to the sixteenth claim of said Goddu patent No. 163,474, and Mr. Renwick's testimony relating thereto, please say whether you agree with or differ from the opinion expressed by him that the defendants' machine does not contain the combination described in said sixteenth claim and your reasons.

Ans. In relation to Mr. Renwick's deposition as to Goddu patent No. 163,474 I concur in what he says describing the Goddu patent and the defendants' machine until he comes to page 39, line 12: "The arms of this rock shaft corresponding with the piece *x*." In my opinion the "arm" does not correspond with the piece *v* in Goddu's patent, but with the pin or bolt B, for it is this piece B in Goddu and the arm in the defendants' machine that shifts the nail receptacles, and alike in both machines these equivalents pieces act, exerting a force they have previously received from the operator, and held latent until a time automatically determined by the machine when the force can be exerted safely, and then, and not till then, shifting the receptacles.

The piece in the defendants' machine that prevents the shifting of the receptacles at the improper time is the pin mentioned in Mr. Renwick's deposition, page 39, line 11, "that is projected into and drawn out of the hole when the other parts of the machine are in such position as to permit the nail ways or nail receptacles to be oscillated with safety. The piece in the plaintiffs' machine which prevents the shifting of the receptacle at the improper time is the nail strip, which is projected into the space between the casting jaws and cut off when the other parts of the machine are in such position as to permit the nailways or receptacles to be oscillated with safety. In my opinion the pin in the defendants' machine and the nail strip in Goddu's are complete equivalents. They act at the same time and for the same purpose, and differ only in that one is

withdrawn from the hole at a certain time in the rotation of the machine and the other is cut off at the same time in the rotation of the machine, and in both the withdrawal and the cutting off are for the same purpose and have the same effect."

In the defendants' machine the pin in the sliding block that carries the nail receptacle, and in the Goddu machine the strip in the oscillating block that carries the nail receptacles, is the obstacle
94 which prevents the receptacles from shifting at the improper time; and, when this obstacle is removed in the defendants' machine by being withdrawn and in the Goddu machine by being cut off, the same latent force, a spring previously compressed by the operator, in both machines acts to shift the receptacles. I say "compressed spring," for the strained muscles of the operator's leg, acting on the treadle in the defendants' machine to shift the receptacles in one direction, is as much a spring as the compressed or strained steel spring which in the defendants' machine acts to shift the receptacles in the other direction, or the compressed steel spring which in Goddu's machine shifts the receptacle in either direction. In my opinion, with respect to the particular inquired of, there is no substantial difference between the two machines.

Int. 8. Please state why machines made according to said McKay and Fairfield reissue No. 7014 have not been made and introduced into use.

Ans. The invention described in reissue 7014 was intended for a machine to make shoes in competition with the American Cable Screw Wire Company's machine. Subsequently I obtained the right to make a patented machine which I cousidered better for the purpose, and prosecuted that machine in exclusion of all others for nailing shoes. I refer to what is commonly known as the standard screw machine, and the work of this machine was so satisfactory to manufacturers that we had no reason to introduce the McKay and Fairfield invention.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for defendants:

Cross-int. 9. Do you see any substantial likeness between the nailways or receptacles in the defendants' machine and the nail carrier of your reissued patent?

Ans. I see that a part of the function of selecting a nail in the complainants' machine is done by a nail carrier, t, and that the same part in the defendants' machine is done by shifting the receptacles (Fairfield's Exhibit No. 1, Fig. 4, c^1 and c^1) to the position they occupy when c takes the place of c^1 and c^1 is removed to c^2.

Cross-int. 10. Mr. Hoadley, as I understand him, has testified that certain portions of the nailways in defendants' machine are not
95 the equivalents of the receptacles marked "v" in your patent, but are the equivalent of the nail carrier t. What is your opinion on these two matters?

(Objected to as being an incorrect statement, according to the complainants' understanding of Mr. Hoadley's testimony.)

Ans. My opinion of the equivalency of the matter inquired about is more as to the function of those parts than as to any portion of them, and that equivalency is explained in my last answer.

Cross-int. 11. The column of nails in the nailway not in use for the time being (in the defendants' machine) you say is arrested by butting against the separator; but suppose the one now in use is as shown at c^2 in Fig. 4 of Fairfield Exhibit No. 1, and state whether or not you noticed in your examination of the machine how the column of nails was arrested when the nailway c was in use and c^1 was out of use.

Ans. I did not see the machine with nails in it, but, from the construction of the machine, as I understand it, the nails in c^1, in the condition inquired of, would be arrested by the carrier e.

Cross-int. 12. That is, the carrier e is the only thing that could operate in that way, if your drawing, Fig. 4 of Fairfield Exhibit No. 1, correctly represents the machine?

Ans. If it represents all that relates to that part.

Cross-int. 13. Do you know why what you call the transferrer e is used in the defendants' machine instead of bringing the receptacle in use, and the recess into which it discharges a nail in such relation to the nail tube f that the recess e^1 will always remain in a line with the nail tube f and the driver? The letters I use are taken from Fairfield Exhibit No. 1.

Ans. I don't see the reason very clearly why it was not done; I see now that it was necessary on account of the awl.

Cross-int. 14. In your original patent you say that the invention consists primarily in the combination, with a nail-driving mechanism and a mechanism that automatically determines the position of the upper surface of the parts to be united, of a transfer mechanism which selects a nail of proper length for the thickness of the part to be united by it and carries it into position to be driven. Is there, in your opinion, in the defendants' machine any mechanism
96 that automatically determines the position of the upper surface of the parts to be united, or any mechanism which is controlled by the thickness of the stock for any purpose, or any mechanism whose motion is more or less varying according to the thickness of the stock?

Ans. The end of the nail tube would automatically determine the position of the upper surface of the parts to be united. The position of the shoe support, or jack, would be varied by the thickness of the stock.

Cross-int. 15. And what is the function, if any, of the varying position of the jack in defendants' machine?

Ans. Only to allow it to take in thicker or thinner leather.

Cross-int. 16. While in your machine the function of the varying position of the nail tube is to determine, by means of a proper train of mechanism, how far the carrier shall move and opposite which receptacle its recess shall stop?

Ans. Yes, sir.

Cross-int. 17. There is nothing in the defendants' machine, is there, which you believe to be substantially the same as this mech-

anism controlled by the rise and fall of the nail tube when the stock varies in thickness, and which acts to give a variable motion to the carrier, in accordance with the varying thickness of the stock?

Ans. I see nothing in the defendants' machine that acts automatically to determine which length of nail shall be used, while the machinery and the mechanism inquired about in plaintiffs' machine acts to automatically determine which length of nail shall be used. In the defendants' machine the determination as to which nail shall be used is made by the operator.

Cross-int. 18. Will you state briefly, by letters, for example, the parts composing the mechanism by which the variable motion of the carrier t is made to conform to the thickness of the stock at the place where the nail is to be driven?

Ans. f, u, w, x, z, g, c^2; m^2 and k^2; l^2.

Cross-int. 19. It seems to me that you should have answered e, f, g, h, i, k, l, u, w, x, y, z, a^2, b^2, c^2, d^2, f^2, k^2, l^2, m^2, n^2, o^2, and r^2, even without including the mechanism which enables the picker i^2 and thin cylinder with the slit g^2 to operate at variable positions.

Please reconsider the matter and state whether you haven't
97 omitted several parts which are strictly essential in the mechanism by means of which thickness of the stock controls the motion of the carrier t and its adjuncts.

Ans. As I understand the question a piece of leather being under the tube f the motion of the part of the carrier t inquired of is the motion which it makes to go to the proper receptacle. If my understanding is correct I think I have named the pieces.

Cross-int. 20. In your testimony you say that the natural jar of the machine when running is sufficient for a certain purpose and that you know this from observation, implying, as I understand you, that you have seen the machine described in your reissue running; please consider that part of your answer and state whether you meant to be understood that you ever had seen one of these machines running.

Ans. I have never seen exactly the machine described in the reissue running, but I have seen machines having the same kind of receptacles where the jar of the machine operated in that way effectively.

Cross-int. 21. As I understand your deposition you think it essential that the transferrer marked e, Fairfield Exhibit No. 1, must have the reciprocating motion, so as to bring the recess e^1 into relation with the nailway to take a nail and then into line with the nail tube that the nail may be driven; do you believe that the defendants' machine would not be substantially the same as the machine described in your reissue if the transferrer were fixed with its recess in line with the nail tube and the driver and the receptacles properly arranged so that either could be brought into proper relation with that recess e^1 at the pleasure of the operator?

(Objected to, because the assumption in the question as to the testimony of the witness is, according to the complainants' understanding of it, incorrect.)

Ans. I do think it essential in the defendants' machine as constructed that the transferrer *e* should have the reciprocating motion described in the question. I believe that the defendants' machine would be substantially the same as the plaintiffs' machine if the transferrer were fixed as suggested in the question in many of
98 the respects claimed in the claims of the reissue, and would use the distinctive feature in that invention which denotes its chief advance in the art, namely: more than one nail receptacle containing nails of different lengths, with power to use one or the other, as the varying thickness of the work requires.

Cross-int. 22. But you do not believe that the machine with the part *e* fixed as suggested in the preceding question will contain the equivalent of the nail carrier described in your reissue, do you?

Ans. If the part *e* were fixed and the nail receptacles were made to be shifted in position so that a nail should be taken from one or the other, that shifting of the receptacles would perform the same function that the carrier *t* performs in the plaintiffs' machine when it passes from the receptacle previously in use for one thickness of leather to the receptacle to be brought into use when a nail of different length is required for a different thickness of leather, and, so far as the parts inquired of perform the same function in the two machines, they are equivalent.

Cross-int. 23. Isn't it pretty clear to you that the real purpose of your reissue was to get rid of the mechanism for transferring a nail from a desired receptacle to a position to be driven and of the mechanism controlled by the thickness of the stock and operating to select a nail of a length according to that thickness as essential elements of the combinations and to make the reissue cover all nail-driving machines which had two or more nail receptacles for nails of two or more lengths, whether the nails went directly from the receptacle into the nail tube under the driver or whether they were transferred from the mouth of the receptacle over the nail tube and under the driver, or whether the thickness of the stock acted or did not act to determine the length of nail driven?

Ans. In my opinion the original patent, claim No. 1, would be infringed by a machine such as is described in the question; for I cannot conceive of a nailing machine using this kind of nail without a nail tube, a nail driver, nail receptacles, and substantially the mechanism for transferring the nail from the receptacle into position to be driven. The question whether the determination of the nail to be selected is in the original patent automatic does not, in my opinion,
99 liberate any machine in which that selection is not automatic, but is made by the will of the operator, from infringing the claim in the original patent, consisting of the nail tube, nail driver, nail receptacles, and mechanism for transferring the nails from the receptacles to a position to be driven.

GORDON McKAY.

Attest:

HENRY C. MERWIN,
Special Examiner.

COMPLAINANTS' EXHIBIT No. 1.

Letters patent of the United States, reissue No. 7014, granted to Gordon McKay, of Cambridge, and Hadley P. Fairfield, of Boston, Massachusetts, assignors to Gordon McKay.

Improvement in Nailing Machines for Boots and Shoes.

Specification forming part of letters patent No. 155,962, dated October 13, 1874; reissue No. 7014, dated March 28, 1876; application filed March 13, 1876.

To all whom it may concern:

Be it known that we, Gordon McKay, of Cambridge, Middlesex county, and Hadley P. Fairfield, of Boston, Suffolk county, all in the State of Massachusetts, have invented certain improvements in nailing machines; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it:

Heretofore the nail used in nailing machines has usually been cut in the machine to the length required by the thickness of the particular parts to be united by it, such nail being sometimes cut from a continuous wire and sometimes from a continuous or ribbon-like plate; but in the present invention the nails are formed of different lengths prior to entering the machine, and with or without heads, and are placed in separate receptacles attached to the machine, from which they are transferred to position to be driven, and the sole and upper are united by metal fastenings, each corresponding in length to the thickness of parts to be united by it.

This invention consists, primarily, in the combination, in a nailing machine and with its nail tube and driver, of nail receptacles—two or more—adapted to receive and support separate nails of different lengths, to be used in different portions of the stock, according to the length of nail required.

The drawing represents the part of the machine which directly embodies the organization and details of organization embracing our invention.

Fig. 1 shows the mechanism in front elevation. Fig. 2 is a side view thereof. Fig. 3 is an opposite side elevation. Fig. 4 is a plan of the nail receiving and transferring mechanism. Fig. 5 is a reverse plan of the same. (Seen in the direction of the arrow in Fig. 2.)

Two pillar-plates, *a b*, and their stands, constitute the stationary framework of the machine and sustain in suitable stationary bearings the driving-shaft *c*. The driving-bar *d* works within the tube *e*, extended through the pillar-plates, and is provided at its lower end with a nail tube or foot, *f*, and mechanism to receive and present nails to be driven. This nail-tube foot is raised or lowered through a lever, *h*, having its fulcrum at *i*, and connected with arms *g* fixed to the tube, a pin or roll on the lever entering a cam-groove, *k*, cut

in the side of the cam-wheel *l* on the driving-shaft, as in the United States letters patent No. 76150. The nail tube, each time it is lifted by the lever *h*, raises the nail-tube foot above the surface of the shoe to a determined distance, while at each descent thereof it rests upon the surface of the shoe, at whatever height such surface may be, thereby calipering the thickness of the parts to be nailed between the nail-tube foot and the work support, the latter being always in a fixed stationary position when the nail-tube foot descends upon it. By these devices we are enabled to supply nails in varying length, as the parts to be nailed vary in thickness.

The driver-bar is fastened at its upper end to an arm, *m*, extending from an arm, *n*, of a lever, *o*, whose other arm, *p*, has a roll or pin extending from it into a cam-groove, *q*, of a cam-wheel, *r*, on the driving-shaft *c*. The bar *d* is directly fastened to the arm
101 *m*, or through an intervening connection, as seen in the drawing. In the intervening connection a supplementary bar and tripping mechanism are used, so that the driver-bar, as it descends, is stopped when the bottom of the driver-bar meets the upper surface of the work, or, in other words, when the driver has driven the nail through, so that the outer end of the nail and the outer surface of the shoe are flush.

This tripping mechanism has already been described in an application for a patent made or to be made by us, and need not herein be further alluded to.

The nail tube *e*, below the bottom pillar-plate, has a vertical arm, *s*, which extends around a carrier or box, *t*, through and by which the nails (of different lengths) are supported and are transferred from the nail receptacles to the nail-tube, the tube *e* extending through the pillar-plate into the arm, which has a passage for the driver, and thence into and through a vertical passage made through the nail carrier, and thence into the nail-tube foot, the nail passage being through the top of the carrier and the side, and thence into the nail-tube foot, the passage being in the axial line of the driver-tube *e*.

The nail carrier *t* is fixed on the foot of a vertical shaft, *u*, extending through a bearing in the arm *s*, and also through a bearing in the bottom pillar-plate, in which latter bearing the shaft is made movable vertically, while it is made rotative in both bearings. On the side of this carrier *t*, opposite the nail tube, is a series of vertical nail receptacles, *v*, which are herein shown as stationary. These receptacles may contain nails of various lengths, placed in them in accordance with the length of the respective nails to be used. The nail receptacles converge toward the nail box, and preferably descend toward it, as seen in Fig. 3. The nail-box shaft *u* has fixed upon its upper end a wheel, *w*, upon which winds a chain, *x*, connected to the bottom of a lever, *y*, by a suitable rod, *z*. This lever has its fulcrum at its upper end, as seen at a^2, and between its uper end and the rod *z* it has a pin or roll extending into a cam-groove, b^2, in one face of a cam-wheel, c^2, fixed on the driving shaft. The chain wheel is made with a groove and flanges that allow the chain to slip vertically without running off the wheel, and a guide, d^2, may be used to keep the

chain and rod in position. After a nail is driven, and before
102 the shoe to be nailed is fed forward, the nail tube and box are raised to permit free movement of the shoe, and the nail tube thrown down by the lever h, after the feed of the shoe, stops at the point where it strikes the upper service of the upper sole, such point being higher or lower accordingly as the parts to be united are more or less thick. This leaves the nail carrier, which moves vertically with the nail tube, more or less near to the bottom of the lower pillar-plate, and through the position of the box, with relation to the lower pillar-plate, a nail of greater or less length is taken from the nail receptacle, the connection for effecting the result being as follows: The box or carrier i is formed in two cylindrical parts or rings. In the outer ring f^2, is a vertical slot, g^2, extending through the ring, and to the outer surface of the inner ring, in which surface is made a vertical nail-carrying groove, h^2, that forms a part of the nail tube, when the parts are in position to bring the groove into line with the nail tube. When the carrier is in position to bring the slot and groove opposite the nail receptacles (the slot being open through to the groove) a suitable spring or finger, i^2, presses a nail from one of the receptacles through into the nail-receiving groove h^2 of the carrier. The nail having been thus placed, the shaft u is turned, bringing the nail groove h^2 and its nail into vertical line with the nail tube above and the nail-tube foot below, suitable devices holding the parts in relative position for the action of the mechanism in receiving a nail, and in transferring it to position where it is received, and to position when the nail is driven.

The mechanism herein shown for selecting from the nail receptacles a nail corresponding most nearly to the thickness of the material, and its operation, is as follows: On the under side of the chain-wheel w is a series of steps, k^2, differing from one another in height as the nails used in nailing vary in length. Preferably this variation should be one-sixteenth of an inch at each nail-trough, and the horizontal distances of the steps are so arranged that when the stepped wheel w is brought over the nail receptacles v the vertical lines of the steps and the nail receptacles will correspond radially. The chain x, which is worked by the cam c^2, revolves the wheel w in one direction, while it is moved in the other direction by the coiled spring l^2. Thus its rotation, by means of the spring,
103 may be arrested in any position, or when the groove g^2 is opposite any of the nail-troughs v. There is a stop, m^2, fixed to the plate a, against which one of the steps, k^2, strikes when the outer carrier ring f^2 is rotated by the coiled spring, and the height of the wheel w determines which of the steps shall arrest the rotation of the wheel w, and also of the carrier t, and the height of the wheel w is determined by the thickness of the stock through the tube f.

The upper end of the outer ring f^2 of the carrier has notches n^2 cut in it, corresponding radially with the nail receptacles v and the steps k^2. A sliding piece, o^2, worked by a projection on the cam l through the lever p^2 and rod q^2, pushes the V-shaped end r^2 of the sliding piece into one of the notches n^2 in the rim of the carrier,

after the nail-chamber h^2 is placed to receive the nail, and this brings the slot g^2 opposite the nail-carrying groove h^2. In order that this groove h^2 may pass by the nails presented by the troughs v that intervene between the driver and the nail-trough, opposite which groove h^2 is stopped by the steps—that is, supposing a nail is required from the fifth trough or receptacle it must pass the first four without taking a nail—the outside ring f^2 of the nail carrier is allowed to move a little over the inner cylinder, the amount of the motion being regulated by the pin and slot t^2, and when this pin is at either end of the slot, the groove h^2 being closed, the nail carrier will pass by the first four nails in the case supposed without taking a nail; then, when arrested opposite the fifth nail-trough, the piece o^2 adjusts the opening g^2 and admits a nail, and the rotation of the carrier, returning to the driver, closes the opening g^2 and retains the nail in the carrier. There is a spring, i^2, that is carried by the rotation of the flange x^2, through the action of the pin u^2 in the slot v and which is controlled by the friction pad w^2. This spring, being elevated and depressed with the nail carrier, is so adjusted in height that it will pass over the tops of the intervening nails, and stop at the one opposite the slot g^2 when that is in position to receive the nail. This spring passes back of the nail to be selected, and, as the slot g^2 is opened, pushes the nail into the groove h^2.

Where nails are to be used having enlarged heads the spring i^2 should be placed below the nail-troughs and made to extend upward, and the nails, supported by their heads on the inclined flanges
104 of the troughs, may be left with their lower ends projecting or exposed beyond the sides of the nail-troughs, so that the spring i^2, entering between the nail next the nail carrier and the next one back of it, will, as it passes them, press each one toward the nail carrier; but the opening g^2 being closed (until after it has been placed in position to take the proper nail), only the right one will be taken into the groove h^2.

In this machine we use the horn for supporting the shoe described in other United States patents, or the shoe may be held on a last; and we use also an automatic feed like the one described in United States letters patent No. 36163.

We claim—

1. In a nailing machine, the combination, with the nail tube and driver, of nail receptacles adapted to receive and support separate nails of different lengths.

2. A series of nail receptacles adapted to sustain nails of different lengths, and with or without heads, in combination with a carrier to remove a nail from either of the receptacles to a position in line with the driver by which it is to be driven, and with a driver to drive the nail from the carrier.

3. A series of nail receptacles adapted to sustain and guide separate nails of different lengths, in combination with a nail tube and driver, and with mechanism to present the nails singly to the nail-tube in line with the driver, substantially as described.

4. The nail tube and driver and receptacles to contain separate nails of different lengths, in combination with mechanism adapted

to select the nails to be driven, according to the thickness of the stock to be united, substantially as described.

5. The combination of the inner and outer rings of the nail carrier with the notched flange and the piece o^2, to open the receptacle for the nail after it is in the proper position to receive the nail, and close it when passing the nail-troughs in either direction, substantially as described.

6. A reciprocating nail carrier, in combination with steps k^2, governed as to their position according to the thickness of the stock, and adapted to regulate the movement of the carrier with
105 relation to the nail receptacles and nail tube and driver, substantially as described.

GORDON McKAY.
HADLEY P. FAIRFIELD.

Witnesses:
FRANK F. STANLEY.
FRED. C. SHEPARD.

COMPLAINANTS' EXHIBIT No. 2.

Letters patent of the United States, No. 163,474, granted Louis Goddu, of Winchester, assignor to American Cable Screw Wire Company, of Boston, Massachusetts.

Improvement in Machines for Nailing Shoe-Soles from Nail-Strips.

Specification forming part of letters patent No. 163,474, dated May 18, 1875; application filed April 20, 1875.

Case A.

To all whom it may concern:

Be it known that I, Louis Goddu, of Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful improvements in machines for nailing shoe-soles from nail-strips; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The invention herein relates to machines for nailing boots and shoes with nails cut from a strip fed by such machine and driven into the stock. In such operation the work is supported upon a jack or horn of suitable construction.

In this construction of machines I have made several important, valuable, and distinctive inventions, the chief design of which
106 is to produce a practically working machine for nailing boots and shoes with nails cut from metallic strips, as it is well known that there is no machine of this kind in use in which metallic nails are supplied by the machine from a strip in a manner to render the machine practically successful and compete with the ordinary nailing machines, in which the nails are cut and supplied from a wire. It has also been attempted in such machine to change

the supply of nails of one length for others of a different length from nail strips during the operation of nailing the shoe, as patented to Parker Wells, of date December 18, 1860. Such machine, although proposing such feature of invention, has never been put upon the market, and, among others, for the reason that it was practically a failure.

In the organization of my machine the feeding of metallic strips of different widths is not only simple, but in the highest degre practical, as the change from a wide to a narrow strip, or *vice versa*, can be made at the will of the operator, not only without regard to the speed but of the operation of the machine, and without liability to the least derangement of the working mechanism or any part thereof. This achievement is one of the things upon which the practical utility of such a machine is based, and is accomplished by what I denominate an automatic accommodating shifting device for the nail-strip carrier, in order that the change from one width to another may be made without regard to the fact as to whether the nail which is at the moment being fed is cut or not, or whether the change of the strip can be made or not, the means for effecting such change having been already made by the operator, and only awaits the severing of the nail already fed between the jaws to actually shift the strip-carrier. This is absolutely necessary, on account of the great speed of the machine, and without the means for accomplishing the thing stated it would be impossible to change the strips between the time of cutting and feeding, for the strip being fed directly across the face of the knife previous to the severing of the nail it will be seen that such nail must be cut before one of a different length can be fed into place. Were this not the case the strip-carrier could not be changed, because there would be practically
107 and constantly a strip between the jaws, and prevent any change in the position of the strip-carrier.

Another very important feature of my invention consists in the combination in such a machine of cutting-jaws, the operation of which, in connection with the strip-carrier and the driver, serves, first, to sever nail; second, compressing the nail to form the head; third, to form the guide-tube for the nail while being driven; and, finally, to form the nose against which the stock is pressed while being supported by the anvil or jack.

The construction and combination of the elements by which these things are done constitute a very advantageous feature in a machine in which the nails are cut and supplied from a metallic strip, and especially the formation of the head of the nail by the same movement which severs the nail, and within the grooved guide through which it is driven, is wholly new to me and of vital importance in a nail-strip-fed peg. Moreover, the cutting and forming of the nail and its head is made under a great compressing force of the jaws, and perfectly filling the nail tube, which is formed by the jaws, and, as the diameter of the driver is necessarily the same size as such tube, it is obvious that the nail cannot be started downward without breaking the driver, unless there is a slight reaction of the jaw or jaws just before the driver strikes the nail in

order to relieve the intense pressure on the nail caused by forming its head, and to make the driving of it through the tube into the leather practical.

In the accompanying drawings, Fig. 1 represents a view in perspective of a sole-nailing machine embracing my invention; Fig. 2, a vertical longitudinal section of the same; Fig. 3, an elevation of the nail severing and forming jaws, in the position they occupy to receive the blank; Fig. 4, a similar view, the jaws being shown as closed to sever and form the nail from the strip; Fig. 5, a view of the under side of the working parts; Fig. 6, a horizontal section taken at the line *x x* of Fig. 2, showing the devices for effecting the feed of the nail-strip in one position; Fig. 7, a similar view with the devices in their changed positions; Fig. 8, a view in perspective of the movable jaw, its carrying-arm, and its bearing-sleeve detached from the machine; Fig. 9, a view in perspective of the shifting nail-strip carrier detached from the machine; Fig. 10, a hori-
108 zontal section through the nail-carrier and its feeding-rolls, and showing the converging strip-feeding channels centrally with the driver, and with which each is brought in line by shifting the carrier; Fig. 11, a front view, showing the fixed and movable jaws removed to show the relation of the strip-feeding channels with the driver; and Fig. 12, a horizontal section at the line 2 2 of Fig. 2.

The machine consists of a working head mounted upon a pedestal, and provided with a jack or horn (not shown) for holding the stock in the usual manner for presenting the work to the action of the machine.

The head, as shown, consists of a single casting, *a*, in which all the working parts are mounted for co-operation, but it may be of any suitable construction. The front plate carries the driver-slide *s*, which has its vertical reciprocating motion imparted to it by a cam, *c*, formed in the balance-wheel, with which the slide connects by a cam-roller mounted upon the upper end of a vertical shaft, s^2, secured in bearings in the frame, and which connects with and operates the nail feeding, cutting, and forming devices at its lower end. The driver-slide *s* works in suitable ways, and carries the steel-driver *d* proper in a vertical position, and for action upon the nail between a fixed and movable jaw, $j\ j^2$, arranged to perform their proper function in the line of the driver and at the front of the head. The combination of these jaws with the driver serves the important purposes of first severing a nail from the strip which is fed in position; secondly, subjecting the nail to a compressing action while and after being cut to form the head; thirdly, to form the pressing-nose, against which the jack or horn holds the work; and, fourthly, to serve as a guide for the nail while being driven into the sole.

The fixed member *j* of the jaws is secured to the front plate, and the movable member j^2 is carried by an L-arm, *b*, pivoted by one branch, b^2, to the main frame, and connected by the other arm to an eccentric pin, *e*, Fig. 2, on the lower end of the vertical shaft s^2, by means of a connecting-rod, e^2, having a ball-joint, e^3, Figs. 8 and

12, with the jaw-arm *b*, to accommodate the joint action of the movable jaw and its operating eccentric pin *e* in opening and closing the jaw. This connecting-rod e^2 is made adjustable by a screw, e^4, bearing upon the ball of the connecting-arm of the eccentric pin, for the purpose of compensating for any wear in the acting or cutting edges of the nail-forming jaws.

The movable jaw j^2 opens and closes in the arc of a circle flush with the front end of the strip carrier, and the strip is received from the carrier between the jaws, as shown in Figs. 3, 4, and 10. The jaws are of steel plates, and they are made removable, for replacement by others, when desired. They are secured by screw-bolts; but these would not afford the requisite holding power, and hence I buttress them in the frame and the movable jaw by abutments, a^2 a^2, which give top and side supports, and render them as solid as if they were part of the frame, while the arm *b* of the movable jaw has bearing against an extension, a^3, in the frame nearly equal to its length, to prevent any possible tendency to depart from a horizontal plane of action while bringing the cutting-jaw against the strip.

Each acting part of the jaws is formed with a groove, terminating in vertical-cutting side edges, as shown in Figs. 8 and 12, so that when closed they form a complete circle, and within which the severed nail is received and its head compressed, and reformed into any desired shape, preferably a cylindrical head, it being understood that this head is reformed preferably from a top-edged shouldered strip, Z. The reforming of the head is to take out any defect therein which might occur under the operation of severing it from the strip, and to give uniform symmetry to the heads of the nails.

The grooves form the feeding-guide for the nail when the jaws are closed, and are, therefore, of a diameter equal to that of the head to be reformed, so that in driving out the nail the head will readily pass out under the action of the driver, which is of a diameter equal to that, or nearly so, of the groove formed by the closed jaws. In forming the head of the nail the closing action of the jaws compresses the metal and holds the nail so firm that it would be impossible to drive it through the jaw-guide without breaking the driver, and to obviate this difficulty the pressure upon the nail between the jaws is slightly relaxed to release the nail just before it is struck by the driver, yet being subjected to a sufficient degree of pressure to form a close guide, through which it is driven into the sole. This action is effected by the co-operation of the eccentric pin *e*, the connecting arm *b*, and the cam *c*, the eccentric pin *e* passing its greatest point of eccentricity just previous to the driver being acted upon by the cam *c*.

The carrier A for the nail strips is of peculiar construction, and is arranged in a horizontal position beneath the frame and in rear of the driver, with its feeding end contiguous to the inner surfaces of the fixed and movable jaws, so as to feed the strips into and through the opening between the jaws. It is suspended by a sleeve, *f*, which passes through a long socketed boss, f^2, on the rear side of the front plate, and is concentric, with a strong, vertical stem, *g*, by which the

nail-strip carrier is also suspended from the same socketed boss, and by which both the carrier and the movable jaw move in concentric arcs, with the inner end of the nail-strip carrier in position flush with the inner faces of the jaws. The short arm b^2 from the movable jaw by this construction plays over and flush with the upper side of the nail-plate carrier, as shown in Fig. 11, whose front end is made smaller than its rear end, as shown in Figs. 9 and 10, and is made rounded at its sides, back of its acting point, to fit closely within a recess in the lower end of the front plate and the contiguous portion of the movable jaw-arm. The nail-plate carrier is capable of being vibrated upon its sleeved stem *g*, which is near the front end, in order that this end will have a much less movement than the rear end, which projects some distance back, and is enlarged to receive the feeding devices for the nail strips, and within which to form two ways or guides, *h*, Fig. 10, for two nail strips. These ways or guides converge from the rear to the front end of the carrier, and are concentric with a radius of about six inches, in order to obtain a proper and easy direction for the feed of the strips. These ways or strip-guides are open at both ends, and conform in their cross-section to that of the nail strip which is passed into the carrier from the rear end.

The object of this construction and arrangement is to feed nail-strips of different widths for use in uniting different thicknesses of materials, such as the sole from ball to ball, which require nails of a longer length than those for the shanks. Nail strips of unequal widths are, therefore, fed into the separate guideways, and one strip is operated upon at a time, and to effect this the carrier is vibrated upon its sleeve-stem to bring the inner end of each guideway at a time in position to feed the strip to the severing and forming —, just in line with the driver. The curve of the nail-strip passages must be such, in connection with the movement of the strip-carrier, so that when the carrier is vibrated upon its pivot *g* its point of delivery will be in a direct line under the driver, which forms a fixed point, where both of the curves described by the strip-passages come in line with the same point. Were it not for this arrangement the direction in which the nail-strips move would not be in harmony with the action of the driver and jaws.

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The nail-strip is fed so that the jaws sever and drive one nail at a time by the following means: A strong back-piece, *i*, rises from the rear end of the carrier A, passing through an opening, j^3, in frame, and is provided with two cylindrical openings, within which are fitted feed-spindles *k*, which pass through the carrier and extend above the back piece. Their lower portions have milled surfaces, as shown in Fig. 10, in a line with and entering the strip guideways *h*, to form a biting surface against the inner side of the strip and feed it to the jaws between rolls i^2 i^2 as the spindles are turned. The upper ends of the spindles are provided with ratchet-wheels *l*, and into these, whichever one being in use for the time, a pawl, *m*, is caused to take to turn the spindle to give the required length of movement to the strip. This is effected by a yoke-slide, *n*, to the sides of which the pawls *m* are pivoted, and from which a stem, n^2,

projects into a guide-socket in the frame standard, and which slide n is connected with and operated by a cam-groove, n^3, formed in the under side of a sleeved disk, n^4, by means of a pin rising from said slide, and provided with a roller (shown in Fig. 2), which, in traversing said groove n^3, gives to the yoke n a reciprocating movement, in which the pawls m are caused to act upon the feed-rolls $l\,k$, on the advance of the slide.

The pawls are maintained in acting positions by springs bearing upon their rear ends outward, and as the movement of these pawls is constant and equal each one is therefore always in readiness to act whichever way the strip-carrier may be shifted. In this the throw of the strip-carrier is limited by the ends of the slot j, within which the back piece i moves, and thereby brings the ratchet-wheel l in contact with the feeding-pawl m on one side only, and at
112 the same instant disengaging the opposite pawl, thereby insuring the certainty of feeding the strip to cut the nails. The accomplishment of this thing involves the necessity of an actuating device for the shifter, which, while having a positive action, must accommodate itself to the action of the jaws by applying the force at any time to shift the strip-carrier, whether it be ready to be shifted or not; or, in other words, apply the force and hold it in suspension until the obstruction is removed by the severing of the nail from the strip, at which point the suspended force is made active and automatic in its function to shift the strip-carrier to use the wide or narrow strip, as may be required for the particular part of the work being nailed. For this purpose I combine with the nail-carrier a triangular driver, p, centrally pivoted to an extension of the lower bar of the frame by a stem, so as to be vibrated thereon. The point of this pivoted driver has a notch, q, which takes into and maintains its hold with a tooth or projection, q^2, Fig. 12, upon a slide-bar, B, fitted into a horizontal opening in the cross-bar of the frame, just in rear of the back piece i, rising from the nail-carrier, and with a notch, r, in which a tooth, r^2, or projection from the front side of the slide-bar B, takes and forms a lock between the pivoted driver p and nail-carrier, as shown more clearly in Fig. 12, sheet 3.

The rear side of the pivoted driver p has a concave form, having a projecting point, s, at each end of the curved surface to form guards for the actuating lever. With this pivoted device I combine a shifting-lever, t, pivoted to the extension of the frame, and provide its front end with a bearing-tongue, u, having a central longitudinal position in said lever for action upon the concave surface of the pivoted driver p. The bearing tongue moves in a guide in the lever t, and a coiled spring in the latter constantly presses upon the inner end of the stem of the bearing-point to force it outward. This pivoted lever t is operated by a handle, v, extending from its side, and the limit of its vibration, as well as that of the pivoted driver p, is determined by the throws of the rear end of the nail-strip carrier, which, as before stated, is limited by the ends of the slot j^3, within which the back piece plays. This movement must be such as to give only an extent of movement to the front end of the strip-carrier A,

equal to the distance between the front ends of the strip-guides h
113 to bring each one in line with the driver. The pivots of the triangular driver p and its actuating lever t are in line, and when the actuating lever is in position to correspond with such line there will be no action of the pivoted driver, and the bearing-slide u will have its maximum rearward movement within its socket, while the strip passages will be on opposite sides of the driver, as shown in Fig. 12. The least movement of the actuating lever t either way allows the slide-point u to exert its force on one arm of the triangular driver p and turn it quickly on its pivot, and thus throw the slide-bar B, and with it the rear end of the nail carrier A, to one side in position to feed the proper nail-strip. Upon reversing the movement of the operating lever t the opposite adjustment of these parts will take place; in either of these adjustments the triangular driver p and its lever t serve to hold the nail-carrier securely in position. The feed of the work is made by a foot, w, carried by a bar, w^2, pivoted to an extension at one side of the frame, the pivot-bolt C passing through a slot, w^3, in the frame, and also in the bar, while the upper end of the bar is hung upon an eccentric pin, x, on the end of a short shaft, x^2, which carries at its opposite end a bevel-gear wheel, x^3, which matches with a bevel-wheel, y, upon the driving-shaft. The action of the eccentric pin x is to give the required lift and descent of the foot, while the point of pivot C in the bar w^2 determines the feed of the work, to make it either coarse or fine, according as the pivot-pin C may be adjusted in the slot. The cam c, for operating the driver, is formed upon the circumference of a horizontal wheel, c^2, which serves the function of a balance-wheel, while also making, by reason of the sharply-formed cam c, a quick blow, which is absolutely necessary. In this function the weight of the balance-wheel adds very considerable advantage, and in fact is a material point to the successful operation of the machine. In addition to this the balance-wheel and the cam-driver also form the cone c^3 for the friction-pulley catch c^4, such cone being formed upon the upper surface of the balance-wheel, as shown in Fig. 2, and the friction-pulley clutch is carried in horizontal position by a lever D, with which it has a swiveling connection, and which being pivoted to the standard is pivoted to the treadle, and put into
and out of action by the depression and release of the treadle
114 by the operator. An adjustable gage, z, for the edge of the work to be moved against to determine the distance at which the nails are to be driven from the edge of the work, is carried by the lower part of the head and fastened with a set-screw.

In the drawings Z, sheet 2, represents cross-sections of shouldered nail-strips of different widths, as used in my nail-strip machine; but nail-strips of any suitable form in their cross-section may be used so long as they are adapted to be carried and fed to the jaws in the way described.

The following is claimed as new in shoe-nailing machines, namely:

1. In a machine for nailing boots and shoes with nails cut from a strip, the combination, with the driver d, of jaws j j^2, between

which the nail is cut from a strip and the head formed by compression by the same movement which effects the severance of the nail, substantially as herein set forth.

2. The combination, in a machine for nailing boots and shoes, of jaws $j\,j^2$, adapted to sever a nail from the strip, then compress the nail and form a head, and become a tube and guide for the nail and driver, substantially as and for the purpose described.

3. The combination, in a nail cutting and driving machine for boots and shoes, of a driver, *d*, and a nail-strip carrier adapted to feed the strip and deliver the severed nail to a compressing and head-forming tube directly in the line of the driver without transfer of the severed nail from the point of entrance, substantially as and for the purpose stated.

4. The combination, in a nailing machine for boots and shoes, of a driver, cutting-jaws, nail-compressing and head-forming tube and guide, and a carrier adapted to automatically deliver nail-strips of different widths, as may be required, directly in the line of the driver and the jaws, essentially as herein set forth.

5. The combination, in a nailing machine for boots and shoes, of a driver, *d*, with a fixed cutter, *j*, and a jaw, j^2, having a movement toward and from the fixed jaw, the two forming a nail-compressing tube-guide when closed, substantially as and for the purpose stated.

6. The combination, in a nailing machine for boots and shoes, of a nail-driver, a nail-strip carrier, and jaws having cutting edges, and a nail-forming guide into which the nail-strip is fed, the nail cut, and its head formed thereby, and driven through said guide-jaws to complete the operation, substantially as herein set forth.

7. The combination, in a nailing machine for boots and shoes, of a nail driver, a nail-strip carrier and jaws having cutting edges, and adapted to compress the nail and form a head thereon, with mechanism for operating the jaws, substantially as herein set forth.

8. In a machine for nailing boots and shoes, the jaws $j\,j^2$, with cutting-edges, forming, when closed, a nail tube or guide for compressing the nail and forming a head thereon, and adapted, one or both, to automatically yield or open slightly just previous to the descent of the driver, substantially as and for the purpose described.

9. The combination, with the movable jaw j^2 and its carrying arm *b* in a nailing and driving machine, and the eccentric *e*, by which said jaw is operated, of the adjustable ball-and-socket joint H, brace connection $e^2\,e^3\,e^4$, whereby the cutting-jaw has a positive action directly from the driving-shaft, substantially as herein set forth.

10. The combination, in a nailing machine for boots and shoes, of a nail-strip carrier, A, having a vertical back-piece, *i*, carrying the feeding-ratchet stems $k\,k\,l\,l$ for the nail-strips, with automatic operating ratchet-pawls, *m*, carried by a yoke-slide, *n*, and operated by an eccentric cam, n^3, on the driving shaft s^2, whereby the feed of the nail-strip is effected with certainty, substantially as herein set forth.

11. The combination, in a nailing machine for boots and shoes,

of a shifting nail-strip carrier, A, having two separate and independent nail-guides, *h*, and a vertical back piece, *i*, carrying two separate and independent feed-ratchet stems, having milled feeding portions, *k*, with a horizontally-operating cam-yoke, *n*, carrying two separate and independent ratchet-pawls, *m*, whereby either ratchet-pawl can be engaged, and the other rendered inoperative by throwing the nail-strip carrier from one side to the other, without arresting the action of the machine, substantially as herein described.

12. The combination, in a nailing machine for boots and shoes, of a nail-strip carrier, A, with the movable jaw-carrier *b*, the pivot-stem *g* of the former being concentric with and inclosed by a sleeve-bearing, *f*, of the jaw-carrier whereby the adjustment of said
116 strip-carrier is made concentric and in co-operation with the action of the movable jaw, substantially as herein set forth.

13. The combination, in a nailing machine for boots and shoes, of a nail-strip carrier provided with a vertical back piece, *i*, which carries the feeding-ratchet stems *k l* of a stop opening, j^3, within the frame, and within which the back piece moves, the ends of which opening serve to limit the throw of the strip-carrier to bring the front end of the strip guides therein at a point in line with the driver and the opening between the jaws, substantially as herein set forth.

14. In a nailing machine for boots and shoes, a pivoted nail-strip carrier having nail-strip passages *h h*, in combination with the driver and a nail-forming tube and guide, to which it operates to feed and deliver nail strips of different widths, substantially as herein described.

15. The combination, in a nailing machine for boots and shoes, of a pivoted vibratable nail-strip carrier, A, having a vertical back piece, *i*, carrying the feeding ratchets, with a shifting slide-bar, B, seated in the frame, and suitable devices for imparting to it a sliding movement to shift the nail carrier, substantially as herein set forth.

16. The combination, in a nailing machine for boots and shoes, of a vibratable nail-strip carrier, A, and the slide-bar B, with a device for applying the changing force to shift such carrier irrespective of the operation of the jaws, whereby an automatic shifting movement of the nail-strip carrier is effected previous to the feeding and cutting of the next nail, and without arresting the action of the machine, and without regard to the action of the jaws, substantially as herein set forth.

17. The combination, in a nailing machine for boots and shoes, of a vibratable nail-strip carrier with a slide-bar, B, connecting therewith, a pivoted triangular driver, *p*, connecting with such slide-bar, and an actuating pivoted lever, *t*, having a sliding tongue, *u*, for operating upon the cam face of the pivoted driver, substantially as and to produce the results herein set forth.

18. The combination, in a nailing machine for boots and shoes, of the cutting and nail-forming fixed and movable jaws $j\,j^2$ with the abutments $a^2\,a^2$ in the frame and movable jaw carrier *b*,
117 whereby a firm support is given to the jaws to sustain them

under their cutting and nail-forming action, substantially as herein set forth.

19. The combination, in a nail cutting and driving machine for boots and shoes, of a driver-bar, *s*, with its operating cam *c* formed upon the surface of the horizontal balance-wheel c^2 of the machine, whereby the blow of the driver is derived directly from the balance-wheel upon the main shaft, substantially as herein set forth.

20. The combination, in a nailing, cutting, and driving machine for boots and shoes, of a driver-bar, *s*, and its operating cam *c* and balance-wheel c^2, with the friction-clutch pulley c^4, whereby the balance-wheel of the machine serves the several purposes of a regulator for the speed of the machine, a driver for the driver-bar, and a means for applying the power and stopping the machine, substantially as herein set forth.

In testimony that I claim the foregoing as my own I have affixed my signature in presence of two witnesses.

LOUIS GODDU.

Witnesses:
A. E. H. JOHNSON.
J. W. HAMILTON JOHNSON.

DEFENDANTS' EXHIBIT M'KAY AND FAIRFIELD ORIGINAL PATENT.

Letters patent of the United States No. 155,962, granted Gordon McKay, of Cambridge, and Hadley P. Firfield, of Boston, Massachusetts, assignors to Gordon McKay.

Improvement in Sole-Nailing Machines.

Specification forming part of letters patent No. 155,962, dated October 13, 1874; application filed July 24, 1874.

To all whom it may concern:

Be it known that we, Gordon McKay, of Cambridge, Middlesex county, and Hadley P. Fairfield, of Boston, Suffold county,
118 and all in the State of Massachusetts, have invented certain improvements in nailing machines; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

The invention relates to the organization of that class of sole-nailing machines in which, the parts to be united being of varying thickness, each nail unites such parts as correspond in thickness to the length of such nail. Heretofore the nail in such machines has usually been cut in the machine to the length required by the thickness of the particular parts to be united by it, such nails being sometimes cut from a continuous wire and sometimes from a continuous or ribbon-like plate; but in the present invention the nails are formed of different lengths prior to entering the machine, and with or without heads, and are placed in respective pockets or receptacles attached to the machine, from which they are automatically removed and

transferred to position to be driven, and so that the sole and upper are united by metal fastenings, each corresponding in length to the thickness of parts to be united by it.

Our invention consists primarily in the combination, with a nail-driving mechanism and a mechanism that automatically determines the position of the upper surface of the parts to be united, of a transfer mechanism, which selects a nail of proper length for the thickness of the parts to be united by it and carries it into position to be driven.

The drawing represents the part of the machine which directly embodies the organization and details of organization embracing our invention.

Figure 1 shows the mechanism in front elevation. Fig. 2 is a side view thereof. Fig. 3 is an opposite side elevation. Fig. 4 is a plan of the nail-receiving and transferring mechanism. Fig. 5 is a reverse plan of the same, seen in the direction of the arrow in Fig. 2.

a b denote two pillar-plates, which, with the stand upon which the lower plates rest and the pillars upon which the upper plates rest, constitute the stationary framework of the machine. *c* denotes the driving-shaft, journaled in suitable stationary bearings. At the front of the framework is a tube, *e*, extending through the lower
119 pillar-plates *a b*, and having extending through it the shank or driver-bar *d*. The tube *e* has at its bottom a nail tube or foot, *f*, and the mechanism that receives and presents the nail to be driven. Said tube is fixed to arms *g*, through which (by a lever, *h*, jointed to one of the arms and fulcrumed at *i*) the nail-foot tube is raised and lowered—the lever having extending from its rear arm a pin or roll that enters a cam-groove, *k*, cut in the side of a cam-wheel, *l*, on the driving shaft—by peculiar mechanism, such as may be seen in the United States letters patent No. 76150.

The nail tube, at each lift thereof by the lever *h*, raises the nail-tube foot above the surface of the shoe to a determined distance, while at each descent thereof it rests upon the surface of the shoe, at whatever height such surface may be, thereby calipering the thickness of the parts to be nailed between the nail-tube foot and the work support, the latter being always in a fixed stationary position when the nail-tube foot descends upon it.

It is by such devices that we are enabled to supply nails in varying lengths, accordingly as the parts to be nailed vary in length.

The driver-bar is fastened at its upperend to an arm, *m*, extending from an arm *n*, of a lever, *o*, whose other arm, *p*, has a roll or pin extending from it into a cam-groove, *q*, of a cam-wheel, *r*, on the driving shaft *c*. The bar *d* is directly fastened to the arm *m*, or through an intervening connection, as seen in the drawing. In the intervening connection a supplementary bar and tripping mechanism are used, so that the driver-bar, as it descends, is stopped when the bottom of the driver-bar meets the upper surface of the work, or, in other words, when the driver has driven the nail through, so that the outer end of the nail and the outer surface of the shoe are flush.

This tripping mechanism has already been described in an application for a patent made, or to be made, by us, and need not herein be further alluded to.

The nail-tube below the bottom pillar-plate has a vertical arm, *s*, which extends around a carrier or box, *t*, through and by which the nails are transferred from the nail receptacles to the nail-tube, the tube *e* extending through the pillar-plate into the arm, which has a passage for the driver, and thence into and through a vertical
120 passage made through the nail carrier, and thence into the nail-tube foot, the nail passage being through the top of the carrier and the side, and thence into the nail-tube foot, the passage being in the axial line of the driver-tube *e*. The nail carrier *t* is fixed on the foot of a vertical shaft, *u*, extending through a bearing in the arm *s*, and also through a bearing in the bottom pillar-plate, in which latter bearing the shaft is made movable vertically, while it is made rotative in both bearings. On the side of this carrier *t*, opposite the nail-tube, is a series of vertical pockets or nail receptacles, *v*, which are stationary. These receptacles vary in depth and contain nails of various lengths, placed in them in accordance with the length of the respective nails to be used and the corresponding depth of the respective pockets. The nail pockets converge toward the nail-box, and preferably descend toward it, as seen in Fig 3. The nail-box shaft *u* has fixed upon its upper end a wheel, *w*, upon which winds a chain, *x*, connected to the bottom of a lever, *y*, by a suitable rod, *z*.

This lever is fulcrumed at its upper end, as seen at a^2, and between its upper end and the rod *z* it has a pin or roll extending from it into a cam-groove, b^2, in one face of a cam wheel, c^2, fixed on the driving-shaft. The chain-wheel is made with a groove and flanges that allow the chain to slip vertically without running off the wheel, and a guide, d^2, may be used to keep the chain and rod in position.

Before the shoe to be nailed is fed forward, after a nail is driven, the nail-tube and box are raised to permit free movement of the shoe, and as the nail tube, after the feed of the shoe, is thrown down by the lever *h*, the nail-tube stops at the point where it strikes the upper surface of the upper sole, such point being higher or lower, accordingly as the parts to be united are more or less thick. This leaves the nail carrier, which moves vertically with the nail tube, more or less near to the bottom of the lower pillar-plate, and through the position of the box, with relation to the lower pillar-plate, a nail of greater or less length is taken from the nail receptacle, the connection for effecting the result being as follows: The box or carrier *t* is formed in two cylindric parts or rings. In the outer ring f^2 is a vertical slot, g^2, extending through the ring and to the outer surface of the inner ring, in which surface is a vertical
121 groove, h^2, that forms a part of the nail-tube when the parts are in position to bring the groove into line with the nail-tube, while, when the carrier is turned so as to bring the slot and groove opposite the nail receptacles, the slot is open through to the groove, a suitable spring or finger, i^2, then pressing a nail from one

of the receptacles through into the nail-receiving groove h^2 of the carrier. The nail having been thus placed the shaft u is turned, bringing the nail groove h^3 and its nail into vertical line with the nail-tube above and the nail-tube foot below, suitable devices holding the parts in relative position for the action of the mechanism in receiving a nail and in transferring it to position where it is received and to position when it is driven.

The mechanism for selecting from the nail receptacles a nail corresponding most nearly to the thickness of the material, and its operation, is as follows: On the under side of the chain-wheel w is a series of circular steps, k^2, cut in the ring; these steps differ from one another in height, as the nails used in nailing vary in length; preferably this variation should be one-sixteenth of an inch at each nail trough, and the horizontal distances of the steps are so arranged that when the stepped wheel w is brought over the nail receptacles v the vertical lines of the steps and the nail receptacles will correspond radially. The chain x, which is worked by the cam c^2, revolves the wheel w in one direction, while it is moved in the other direction by the coiled spring l^2; thus its rotation, by means of the spring, may be arrested in any position, or when the groove g^2 is opposite any of the nail troughs v. There is a stop, m^2, fixed to the plate a, against which —one of the circular steps k^2 when the carrier f^2 is rotated by the coiled spring, and the height of the wheel w determines which of the steps shall arrest the rotation of the wheel w and also of the carrier t, and the height of the wheel w is determined by the thickness of the stock through the tube f. The upper rim of the carrier f^2 has notches n^2 cut in it, corresponding radially with the nail receptacles v and the steps k^2. There is a sliding piece, o^2, worked by a projection on the cam l through the lever p^2 and rod q^2, which, at the proper time—*i. e.*, after the nail chamber h^2 is placed to receive the nail—pushes the V-shaped end r^2 of the sliding piece into one of the notches n^2 in the rim of the carrier, and this
122 brings the slot g^2 opposite the nail chamber h^2. In order that the receptacle h^2 may pass by the nails presented by the troughs v, that intervene between the driver and the nail trough, opposite which the receptacle h^2 is stopped by the circular steps—that is, supposing a nail is required from the fifth trough, it must pass the first four without taking in a nail—the outside casing f^2 of the nail carrier is allowed to move a little over the inner cylinder, the amount of the motion being regulated by the pin and slot t^2; and when this pin is at either end of the slot the nail chamber h^2 is closed; therefore, the nail carrier will pass by the first four nails in the case supposed without taking a nail; then, when arrested opposite the fifth nail trough, the piece o^2 adjusts the opening g^2 and admits a nail, and the rotation of the carrier returning to the driver closes the opening g^2 and retains the nail in the carrier. There is a spring, i^2, that is carried by the rotation of the flange x^2, through the action of the pin u^2, in the slot v^2, and which is controlled by the friction pad w^2. This spring being elevated and depressed with the nail carrier is so adjusted in height that it will pass over the tops of the intervening nails and stop at the one opposite the slot g^2 when

that is in position to receive the nail. This spring passes back of this nail and at the opening of the slot g^2 pushes the nail into the receptacle h^2.

Where nails are to be used having heads like the heads of wood screws, the spring i^2 should be placed below the nail troughs and made to extend upward, and the nails being supported by their heads on the inclined flanges of the troughs may be left with their lower ends projecting or exposed beyond the sides of the nail troughs, so that the spring i^2, entering between the nail next the nail carrier and the next one back of it, will, as it passes them, press each one toward the nail carrier, but the opening g^2 being closed until after it has been placed in position to take the proper nail only the right one will be taken into the receiver h^2.

In this machine we use the horn for supporting the shoe described in other United States patents, or the shoe may be held on a last; and we use also an automatic feed like the one described in United States letters patent No. 36163.

We claim—

1. The combination, with a nail-tube and nail-driver, of the
123 nail receptacle and mechanism, substantially as shown, for transferring the nail from the receptacles to position to be driven, all substantially as and for the purposes described.

2. The combination, with the the nail-tube and nail-driver, of nail receptacles and transferring mechanism, so constructed and arranged, and so operating that the nails are selected in accordance with their respective lengths, and are transferred and positioned to unite parts corresponding in thickness to the length of the respective nails.

3. The combination of the inner and outer rings in the nail carrier with the notched flange and the pieces o^2, acting substantially as described, to open the receptacle for the nail after it is in the proper position to receive the nail and close it when passing the nail troughs in either direction.

Executed this 18th day of July, A. D. 1874.

GORDON McKAY.
H. P. FAIRFIELD.

Witnesses:
M. W. FROTHINGHAM.
C. WARREN BROWN.

124 The following is the opinion of the court upon which the decree dismissing the bill of complaint was entered in said cause, June 22, 1883:

Opinion of the Court. (*June* 22, 1883.)

Circuit Court of the United States, District of Massachusetts.

GORDON McKAY *et al.* }
v. } No. 1056, Equity Docket.
EDMUND M. STOWE *et al.* }

Before Gray and Lowell, J. J.

GRAY, *J.:*

This is a bill in equity for the infringement of two patents for

improvements in machines for nailing the soles of boots and shoes.

The first patent was granted to Gordon McKay, as assignee of himself and Hattie P. Fairfield, on October 13, 1874, and was reissued on March 28, 1876, on an application filed March 13, 1876.

The original specification describes, with the aid of accompanying drawings, a most complex and ingenious mechanism, the principal parts of which are—1st, a nail-tube resting upon the sole, and which is raised or lowered according to the thickness of the stock; 2d, a nail-driver; 3d, a series of stationary vertical nail receptacles, varying in depth, and containing nails of various lengths; and, 4th, a nail-carrier, by which the nails are selected and transferred from the nail receptacles to the nail-tube. "The mechanism for selecting from the nail receptacles a nail corresponding most nearly to the thickness of the material, and its operation," are described in great detail.

125 In the reissue the main body of the description is not substantially varied, although perhaps a little warped, so as to give countenance to the remarkable changes at the beginning and end of the specification.

At the beginning of the original specification the inventors "declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

"*The invention relates to the organization of that class of sole-nailing machines in which, the parts to be united being of varying thickness, each nail unites such parts as correspond in thickness in the length of such nail.* Heretofore the nail [used] in *such* [nailing] machines has usually been cut in the machine to the length required by the thickness of the particular parts to be united by it, such nail[s] being sometimes cut from a continuous wire and sometimes from a continuous or ribbon-like plate; but in the present invention the nails are formed of different lengths prior to entering the machine, and with or without heads, and are placed in *respective pockets or* [separate] receptacles attached to the machine, from which they are *automatically removed and* transferred to position to be driven, and *so that* the sole and upper are united by metal fastenings, each corresponding in length to the thickness of parts to be united by it.

"*Our invention consists primarily in the combination, with a nail-driving mechanism and a mechanism that automatically determines the position of the upper surface of the parts to be united, of a transfer mechanism, which selects a nail of proper length for the thickness of the parts to be united by it, and carries it into position to be driven.*"

The reissue omits the words printed above in italics, and inserts those printed in brackets, and substitutes for the last sentence above quoted the following:

126 "This invention consists, primarily, in the combination, in a nailing machine and with its nail tube and driver, of nail receptacles—two or more—adapted to receive and support separate

nails of different lengths, to be used in different portions of the stock, according to the length of nail required."

The original specification ends with three claims, the first and second of which (being the only ones material to this case) are as follows:

"We claim—1. The combination, with a nail-tube and nail-driver, of the nail receptacles and mechanism, substantially as shown, for transferring the nail from the receptacles to position to be driven, all substantially as and for the purposes described.

"2. The combination, with the nail tube and nail-driver, of nail receptacles and transferring mechanism so constructed and arranged and so operating that the nails are selected in accordance with their respective lengths, and are transferred and positioned to unite parts corresponding in thickness to the length of the respective nails."

The reissue substitutes for these two claims the following four claims:

"We claim—1. In a nailing-machine the combination, with the nail tube and drive, of nail receptacles adapted to receive and support separate nails of different lengths.

"2. A series of nail receptacles adapted to sustain nails of different lengths, and with or without heads, in combination with a carrier to remove a nail from either of the receptacles to a position in line with the driver by which it is to be driven, and with a driver to drive the nail from the carrier.

"3. A series of nail receptacles adapted to sustain and guide separate nails of different lengths, in combination with a nail tube and driver, and with mechanism to present the nails singly to the nail-tube in line with the driver, substantially as described.

127 "4. The nail tube and driver and receptacles to contain separate nails of different lengths, in combination with mechanism adapted to select the nails to be driven, according to the thickness of the stock to be united, substantially as described."

The parts of the original patent and of the reissue above quoted sufficiently show the wide and essential difference between the two. The original specification, at the very outset, declares that the invention primarily consists in the combination, with the other designated parts of the machine, of a transfer mechanism, which automatically selects and carries into position to be driven a nail of proper length for the thickness of the parts to be united. And both claims of that specification are equally limited; the second, by a full and explicit statement of this distinguishing characteristic, and the first, with equal clearness and like legal effect, by the words of reference to the preceding description, "substantially as shown," and "all substantially as and for the purpose described."

The specification of the reissue begins by ignoring and repudiating the leading declaration of the original specification, and by declaring that the invention primarily consists not in the combination with the nail-tube, nail-driver, and nail receptacles of the curious mechanism for selecting from the receptacles and carrying to the driver nails of different lengths, but in the mere combination, with the tube and driver, of the receptacles to hold nails of different sizes, and it undertakes to enlarge the claim accordingly.

This is not a case of supplying an omission or correcting a mistake in the original patent, but it is a deliberate attempt by the inventors to contradict the leading assertion most positively and unequivocally made by them in their first specification, and
128 to enlarge their claim so as to cover a combination which omits the most ingenious and distinctive element of the combination originally patented. To allow a claim to be so enlarged by a reissue after the lapse of seventeen months, during all which time the inventors cannot have been ignorant of what was their real invention, or of what they had so explicitly declared it to be in the original patent, would be unreasonable and mischievous.

In the defendants' machine the selection of the nails to be driven is not made automatically, according to the thickness of the sole to be nailed, but it is controlled by the direct intervening action of an attendant, interrupting the automatic action of the machine at such times as he chooses.

The result is that the first, second, and third claims of the reissue cannot be upheld, and that the defendants have not infringed the fourth claim of the reissue. Gage *v.* Herring, 108 U. S. S. C.; 2 Sup. Ct. Reporter, 819.

For similar reasons the plaintiffs fail to show any infringement of the patent granted to Louis Goddu on May 18, 1875.

Bill dismissed with costs.

E. MERWIN AND
J. J. STORROW,
For the Plaintiffs.

B. F. THURSTON AND
J. E. MAYNADIER,
For the Defendants.

129 UNITED STATES OF AMERICA, *Massachusetts District*, } *ss:*

I, John G. Stetson, clerk of the circuit court of the United States for the district of Massachusetts, within the first judicial circuit, certify that the foregoing is a true copy of the record of said circuit court in the cause of Gordon McKay *et al.*, trustees, complainants, *v.* Edmund M. Stowe *et al.*, defendants, lately determined in said circuit court.

In testimony whereof I hereunto set my hand and affix the seal of said circuit court, at Boston, in said district, this first day of Sep-

tember, A. D. 1883, and of the Independence of the United States the one hundred and eighth.

[Seal of the Circuit Court, Massachusetts.]

JOHN G. STETSON, *Clerk.*

130 *Bond to Party on Appeal.*

Know all men by these presents that we, Gordon McKay and James W. Brooks, both of Cambridge, in the district of Massachusetts, trustees of the McKay Metallic Fastening Association, as principals, and Albert Van Wagener and Nathaniel S. Hotchkiss, both of Boston, in said district, as sureties, are held and firmly bound unto Edmund M. Stowe, Charles C. Bills, and Richard S. Whitney, all of Hudson, in said district, in the full and just sum of five hundred dollars, to be paid to the said Edmund M. Stowe, Charles C. Bills, and Richard S. Whitney, their certain attorney, executors, administrators, or assigns; to which payment well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, by these presents.

Sealed with our seals and dated the second day of July, in the year of our Lord one thousand eight hundred and eighty-three.

Whereas lately at a circuit court of the United States within and for the district of Massachusetts, in a suit in equity depending in said court between said Gordon McKay and James W. Brooks, trustees as aforesaid, complainants, and the said Edmund M. Stowe, Charles C. Bills, and Richard S. Whitney, defendants, decree was rendered against the said complainants, and the said complainants having obtained an appeal to remove the said cause to the Supreme Court of the United States to reverse the decree in the aforesaid suit and a citation directed to the said — citing and admonishing them to be and appear at a Supreme Court of the United States to be holden at Washington on the second Monday of October next:

Now, the condition of the above obligation is such that if the said complainants shall prosecute their said appeal to effect and answer all damages and costs if they fail to make their plea good, then the above obligation to be null and void; otherwise to remain in full force and virtue.

GORDON McKAY, *Trustee,*
By F. F. STANLEY, *Attorney.* [L. S.]
JAMES W. BROOKS, *Trustee.* [L. S.]
A. VAN WAGENER. [L. S.]
N. S. HOTCHKISS. [L. S.]

Signed, sealed, and delivered in presence of—
EDW'D P. HURD.

Approved:
JOHN LOWELL,
Circuit Judge.

A true copy of the bond taken by the judge at the time of allow-

ing the appeal named in said bond, which bond is on file in the office of the clerk of the circuit court of the United States for the first circuit and district of Massachusetts.

Attest: JOHN G. STETSON,
Clerk U. S. C. C., Mass. Dist.

Endorsed on cover: Massachusetts C. C. U. S. No. 365. Gordon McKay and James W. Brooks, trustees of the McKay Metallic Fastening Association, appellants, *vs.* Edmund M. Stowe, Charles C. Bills, and Richard S. Whitney. Filed 8th October, 1883.